

VOL. XIX

NO. 1

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT

DENTAL NUMBER

JULY, 1923
(MONTHLY)



Compiled and published under authority of Naval Appropriation Act
for 1923, approved 1 July, 1922

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

Owing to the exhaustion of certain numbers of the BULLETIN and the frequent demands from libraries, etc., for copies to complete their files, the return of any of the following issues will be greatly appreciated:

Volume VII, No. 2, April, 1913.
Volume VIII, No. 1, January, 1914.
Volume VIII, No. 3, July, 1914.
Volume VIII, No. 4, October, 1914.
Volume X, No. 1, January, 1916.
Volume XI, No. 1, January, 1917.
Volume XI, No. 3, July, 1917.
Volume XI, No. 4, October, 1917.
Volume XII, No. 1, January, 1918.
Volume XII, No. 3, July, 1918.

SUBSCRIPTION PRICE OF THE BULLETIN.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Yearly subscription, beginning January 1, \$1.50; for foreign subscription add \$1.00 for postage.

Single numbers, domestic, 15 cents; foreign, 24 cents, which includes foreign postage.

Exchange of publications will be extended to medical and scientific organizations, societies, laboratories, and journals. Communications on this subject should be addressed to the Surgeon General, United States Navy, Washington, D. C.

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PREFACE.

The UNITED STATES NAVAL MEDICAL BULLETIN was first issued in April, 1907, as a means of supplying medical officers of the United States Navy with information regarding the advances which are continually being made in the medical sciences, and as a medium for the publication of accounts of special researches, observations, or experiences of individual medical officers.

It is the aim of the Bureau of Medicine and Surgery to furnish in each issue special articles relating to naval medicine, descriptions of suggested devices, clinical notes on interesting cases, editorial comment on current medical literature of special professional interest to the naval medical officer, reports from various sources, historical essays, notes and comments on topics of medical interest, and reviews or notices of the latest published medical books.

The bureau extends an invitation to all medical officers to prepare and forward, with a view to publication, contributions on subjects of interest to naval medical officers.

In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will recommend that a letter of commendation be forwarded to him upon the acceptance of his manuscript for publication, and that a copy of this letter be attached to his official record.

The bureau does not necessarily undertake to indorse all views or opinions which may be expressed in the pages of this publication.

E. R. STITT,
Surgeon General United States Navy.

NOTICE TO SERVICE CONTRIBUTORS.

When contributions are typewritten, *double spacing* and wide margins are desirable. Fasteners which can not be removed without tearing the paper are an abomination. A large proportion of the articles submitted have an official form, such as letterheads, numbered paragraphs, and needless spacing between paragraphs, all of which require correction before going to press. The BULLETIN endeavors to follow a uniform style in headings and captions, and the editor can be spared much time and trouble and unnecessary errors can be obviated if authors will follow in the above particulars the practice of recent issues.

The greatest accuracy and fullness should be employed in all citations, as it has sometimes been necessary to decline articles otherwise desirable, because it was impossible for the editor to understand or verify references, quotations, etc. The frequency of gross errors in orthography in many contributions is conclusive evidence that authors often fail to read over their manuscripts after they have been typewritten.

Contributions must be received two months prior to the date of the issue for which they are intended.

The editor is not responsible for the safe return of manuscripts and pictures. All materials supplied for illustrations, if not original, should be accompanied by a reference to the source and a statement as to whether or not reproduction has been authorized.

The BULLETIN intends to print *only original articles, translations, in whole or in part, reviews, and reports and notices of Government or departmental activities, official announcements, etc.* All original contributions are accepted on the assumption that they have not appeared previously and are not to be reprinted elsewhere without an understanding to that effect.

U. S. NAVAL MEDICAL BULLETIN

VOL. XIX

JULY, 1923.

No. 1

SPECIAL ARTICLES.

THE NAVY DENTAL SCHOOL.

By the Faculty.

The Navy Dental School opened February 3, 1923, as the dental department of the United States Naval Medical School.

Its purpose is to furnish postgraduate instruction in dental medicine to officers of the Dental Corps of the Navy and to train and equip men of the Hospital Corps as assistants to dental officers.

Instruction is given in two courses of four months each, commencing in February and September.

The establishment of the school is the result of a recognition of the value of dentistry in the Navy as a factor in assisting to preserve the health of the personnel and an appreciation of the importance of furnishing the highest class of dental skill that the profession affords.

The school is located on the grounds of the United States Naval Hospital at Washington, D. C., in a building devoted to other uses during the war which has been adapted to the requirements of the instruction to be given.

No dental institution in this country is better equipped with instruments and appliances for carrying on dental instruction. Only the most modern and well-tried equipment has been installed, and only a sufficient amount has been purchased to meet present needs and to allow for the addition of future improvements if such are developed.

The situation of the dental school, in close proximity to the main building of the United States Naval Medical School, is such that its students have the benefit of instruction in basic medical subjects at the medical school proper. These subjects are taught by the officers of the medical school faculty in connection with the instruction given to medical officers of the regular class. The facilities of the medical school proper are at the disposal of student dental officers, and the joint instruction in bacteriology, medical diagnosis, and similar subjects, the use of the museum of classified material, etc., is invaluable.

A department of considerable importance to the school is the prosthetic laboratory maintained to care for the needs of the service in respect to the construction of prosthetic appliances and to provide

instruction to both officers and hospital corpsmen in this branch of dentistry.

The Surgeon General has authorized the construction in this laboratory of crowns, bridges, artificial dentures, and all other appliances in which the use of precious metals may be required, to be furnished patients at Government expense and at the discretion of the senior dental officer in charge with a view toward determining the expense which would be involved in extending this class of dentistry to the entire service.

The operating clinic and surgical department, in addition to furnishing a means for instruction in operative dentistry and oral hygiene, furnishes dental service to the naval hospital.

The first class under instruction is composed of 5 dental officers and 10 hospital corpsmen, the latter to be trained as dental technicians and assigned to dental duty only. It is expected that subsequent classes will bear about the same ratio to the size of the Dental Corps.

DESCRIPTION OF SCHOOL BUILDING.

The Navy Dental School is housed in a one-story building erected as a part of the general expansion of the United States Naval Hospital, Washington, D. C., during the war, and turned over to the Naval Medical School some time ago to accommodate the activities of the proposed dental school and the school of aviation medicine.

It is situated on the grounds of the hospital reservation somewhat below the level of the hospital proper, on the river side, and faces the new Lincoln Memorial.

The school proper consists of a small waiting room and business office, from which there are two swinging doors opening on either side into the two largest departments of the school. The operating clinic on the right of the entrance is a room approximately 25 by 40 feet in size, containing a railed inclosure and desks for the officer in charge and the dental nurse. Facing these desks is a row of five electrodental operating units with chairs, cabinets, operating stands, etc., each unit representing a complete dental office in itself operating independently and according to a set standard. The position of all chairs and other equipment is exactly the same; each has its own sterilizer, waste receiver, light, etc.; and every instrument used has its own place to which it is returned after use. Electro dental units and chairs are finished in mahogany; other equipment is in white enamel and nickled steel.

The floor is covered with linoleum, which furnishes the required amount of resiliency and dispenses with rubber operating mats. A

large sterilizer in one end of the room represents the sick bay aboard ship from which sterile linen towels, etc., are received and issued. The room is lighted by a row of large windows extending across the side of the building in front of the operating chairs, and the natural light is supplemented on dark days by a double row of specially constructed lights extending down the center of the clinic, in addition to a Bosworth dental light at each chair.

Two doors open from the operating clinic into a passage at the rear, from which in turn two entrances exist for passage to the X-ray room and oral surgery. The X-ray room is approximately 20 by 10 feet in size and is equipped with a Wappler-type X-ray machine having interchangeable medical and dental arms and a Cool-edge tube. Opening from the X-ray room is a small dark room for transillumination.

The oral surgery adjoins the X-ray room and is equipped with the usual operating chair, cabinets, and specially designed instruments for the performance of all minor surgery about the mouth. In this room and in the X-ray room are kept the greater part of the special files, the desk of the officer in charge being screened from the operating part of the room.

At the left of the waiting room a swinging door opens into the prosthetic laboratory, which is the largest of the rooms in the school. The most modern type of prosthetic operating benches are ranged in double files down the length of the room, the benches on the left of the entrance being designed for the use of the student officers and those on the right hand for the instruction of hospital corpsmen. Each bench is piped for gas and air, and there is one lathe for every two benches. There are 20 benches in all.

On the left of the entrance is the casting and soldering bench, occupying half the width of the room and equipped with both Burns and Marshall casting machines, porcelain furnace, etc. To the right of the entrance is the vulcanizing bench and plaster bench. Each prosthetic bench is equipped with a Supplee heating unit for modeling compound.

At the lower end of the laboratory is a railed-off elevated inclosure for the officer in charge, furnished with a desk, chairs, etc., and containing a large glassed-in set of shelves for the stowage of supplies and instruments not in use. Opposite this inclosure is a specially made bench and dental chair for impression work, separated from the main laboratory by an arrangement of movable curtains and poles.

A second entrance from the exterior of the building opens into the locker room for hospital corpsmen and passageway extending

from the prosthetic laboratory to the end of the building. Off this passageway opens first the prosthetic clinic. This clinic is small, and arrangements are being made for its enlargement. At present it consists of but two chairs and cabinets for impression work.

The X-ray developing laboratory opens off the prosthetic clinic. This laboratory follows the general pattern of laboratories of this type and is equipped with specially constructed tanks for the development of a large number of films. In this laboratory is kept all the film stock, developing material, extra parts, and material used in X-ray work.

The first of the two lecture rooms in active use opens off the passageway through the locker room. This room is used for lectures by officers and corpsmen alike. It is equipped with the usual blackboards, chairs of the broad-arm type, a stereopticon for the projection of films and slides used in lecture work, and a part of the school library.

The second lecture room adjoins and is somewhat smaller, being equipped in a similar manner.

THE GENERAL SERVICE ACTIVITIES OF THE SCHOOL.

The dental school has a threefold function. In addition to the instruction being carried on, the institution provides a working laboratory for the construction of special prosthetic appliances which are being gradually introduced as a part of the dental service furnished the Navy, and which additional service, if found practicable, will be extended eventually to embrace all ships and stations.

In connection with this prosthetic work, the following extracts from the indorsement of the Bureau of Medicine and Surgery to a letter requesting the removal of existing restrictions in the practice of dentistry in the Navy will illustrate the work being undertaken:

"The bureau has had under consideration for more than a year the matter of extending the scope of dental practice in the Navy, and has already taken preliminary steps in that direction by the establishment of a dental school for the purpose of training officers in the technique of prosthetic work and by the fitting up of a laboratory for the manufacture of dental appliances.

"Arrangements are already under way for the establishment of a second laboratory on the west coast and similar institutions elsewhere as needs may arise; these central laboratories are intended to do the mechanical dental work for ships and stations throughout the entire service, as the appropriations available will not permit of the establishment of even the smallest laboratories at each station and on board ship.

"Attention is invited to the fact that these plans, already approved, precede the abolishment of the existing restrictions in so far as conditions warrant, and that no arbitrary limitations have been set for the future extension of dental practice, except those restrictions made necessary by available moneys within the annual appropriations, but the developments already under way at the dental school and laboratory will be carefully studied, and the experience gained will guide the bureau as to what possible further expansion may be gradually undertaken, and will determine whether increase appropriations must be secured.

"The first and primary duty of the dental officer is 'to serve professionally the personnel of the naval service' in the preservation of teeth and the prevention of disease, and prosthetic and other more elaborate refinements of dentistry should not be undertaken to the interference with this primary duty, or until such primary duty shall have been fulfilled.

"It is the bureau's intention to bear the cost of all dental materials (including precious metals) used at the dental school, and the laboratories established and in preparation, for at least a year or two, in order to ascertain what will be the cost to the Government, and to then determine whether the practice can be continued under existing conditions, or if greater appropriations will be necessary. Dental treatment is a part of 'medical attendance' (Comptroller's decision, December 20, 1919), and the just expenses therefor should be defrayed by the Government when within the limits established by the department, which has administrative jurisdiction under the law in the determination of the character and scope of the work which shall be a public charge.

"With the present limited dental personnel it is not believed that very much prosthetic and mechanical dental work could be undertaken in addition to, and without interfering with, the duties described; the experience gained at the dental school and laboratory, however, will demonstrate how much may be safely authorized."

In compliance with this additional service the school laboratory, by utilizing the services of the student officers detailed for instruction, has undertaken and is carrying on considerable mechanical work for the general service.

The third function of the school is to furnish dental service to the United States Naval Hospital at Washington.

The Medical Department of the Navy maintains a well-equipped dental clinic in all its hospitals, with the exception of the naval hospital at Washington, D. C. The dental service for this hospital was formerly furnished by the naval dispensary at the Navy Depart-

ment Building. Here a small laboratory was maintained, and a number of dental officers were kept on duty to care for this work.

This laboratory has been discontinued and the number of dental officers reduced, the dental service for the hospital now being given at the dental school on the hospital grounds.

For some years it has been the custom to transfer to the naval hospital at Washington patients in need of extensive dental treatment not procurable at other places, especially those cases where there has been extensive loss of tooth structure by reason of accident incident to service.

This custom is still in effect, and the work performed in the school clinic and laboratory in caring for these cases is no inconsiderable feature of the school activities.

This threefold function of the Navy Dental School operates so as not to deprive the Navy of the services of such dental officers and corpsmen who may be detailed to the school for instruction purposes.

NAVAL REGULATIONS, NAVAL CUSTOMS, AND DUTIES OF DENTAL OFFICERS.

The course in naval regulations, naval customs, and the duties of dental officers consists of a series of lectures covering these subjects and is designed to emphasize those duties of the dental officer which have but little to do with his profession but are incumbent upon him as a naval officer.

This course embraces an appreciation of those duties aboard ship and ashore which a dental officer may be called upon to perform in addition to his professional duties, and includes an outline of the general policy of the corps in respect to a certain amount of differentiation to be shown in the character and class of the professional services to be rendered.

It considers at length the importance of obtaining a proper appreciation of the relative value of the Dental Corps of the Navy, the necessity and means by which it can cooperate with the Medical Corps in order to function with greatest efficiency, and is designed to promote unity of ideas and operation in all phases of work.

The importance of accuracy in recording treatment given, the disposition and handling of records, the duties of dental officers as differentiated from medical officers, etc., is considered in this course in addition to the importance of conforming to accepted naval customs.

Roster of instruction.

FOR STUDENT OFFICERS.

Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9-10. Medical Department duties.	9-10.30. Bacteriology.	9-12.15. Dental prosthesis.	9-10. Medical Department duties.	9-10. Preventive dentistry.	9-9.30. Inspection.
10-12.15. Dental prosthesis.	10.30-12. Clinical dentistry.		10-12.15. Dental prosthesis.	10-12.15. Dental prosthesis.	9.30-12. Dental prosthesis.
12.15-1.15. Noon hour—Luncheon.					12.15-1.30. Drill.
1.15-4.30. Clinical dentistry	1.15-2.15. Dental radiology.	1.15-2.15. Bacteriology.	1.15-2.15. Minor oral surgery.	1.15-3.30. Clinical dentistry.	1.30-4.30. Clinical dentistry.
	2.15-4.30. Clinical dentistry.	2.15-3.30. General pathology.	2.15-4.30. Clinical dentistry.		
		3.30-4.30. Haematology.		3.30-4.30. Metallurgy.	

FOR DENTAL TECHNICIANS.

Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
9-10. Bacteriology and oral pathology.	9-10. Chemistry and metallurgy.	9-11. Dental radiology, group No. 1. Oral prophylaxis, group No. 2.	9-10. Dental anatomy.	9-10. Prosthetic technic lecture.	9-9.30. Inspection.
10-12.15. Oral prophylaxis.	10-12.15. Operative assistance, group No. 2. Prosthetic laboratory, group No. 1.	11-12.15. Oral hygiene.	10-11. Dental anatomy laboratory.	10-12.15. Dental radiology, group No. 2. Oral prophylaxis, group No. 1.	9.30-11. Oral prophylaxis.
			11-12.15. Dental histology.		11-12. Hospital Corps Manual.
12.15-1.15. Noon hour—Luncheon.					12.15-1.30. Drill.
1.15-4.30. Operative assistance, group No. 2. Prosthetic laboratory, group No. 1.	1.15-4.30. Operative assistance, group No. 1. Prosthetic laboratory, group No. 2.	1.15-4.30. Prosthetic laboratory.	1.15-4.30. Operative assistance, group No. 2. Prosthetic laboratory, group No. 1.	1.15-3.30. Operative assistance, group No. 1. Prosthetic laboratory, group No. 2.	1.30-4.30. Clinical dentistry laboratory.
				3.30-4.30. Field day.	

OPERATIVE DENTISTRY.

An endeavor is made to have the curriculum embrace the standard operative procedures of modern dental practice. Black's Operative Dentistry is used as a textbook, and the procedures set forth therein are defined. Conclusions reached by men of experience in civil practice are quoted for the benefit of the student officers. Where methods of treatment have given uniformly excellent results, these are advised as standards which should be striven for in routine practice.

The question of the treatment of teeth from which vital pulps have been removed seems to have reached a uniform basis in only one particular, and that is that strict asepsis is indicated during every stage—gaining access to pulp, removal, enlarging of canals, and filling of the same. An attempt to set forth the pros and cons of the various methods advanced is of such magnitude that to undertake it would only open for discussion a subject which is by no means settled. It is hoped that the results of a series of scientifically conducted experiments in this direction will be available within the next few months. These are being conducted under the auspices of an internationally known institution where every facility has been afforded, and the results when published will be of interest to the dental and medical professions—to the former as authority for the use or disuse of certain procedures, and to the latter for the bearing which they undoubtedly will have on the phase of focal infection in relation to nonvital teeth which have received the best of dental attention.

Stress, of course, is laid on the necessity of preserving the vitality of pulps, and to this end operative procedures are outlined. It would seem that the method advocated by Dr. Elmer Best, of attempting to preserve the original outline of the pulp chamber in order to prevent pressure and the intrusion of a foreign material against the pulp tissues, offers the most fertile field of expectations in this direction. The results of such practice are set forth in current issues of the Journal of Dental Research, and a number due to appear about the time of this writing is to contain a summary of the replies received from a questionnaire on the subject sent by Doctor Best to selected men throughout the United States. This should be of vital interest to the dental profession. No doubt statistics from the personal experience of Doctor Best will also appear, and these will be of value as from an exponent of the practice of preserving vitality with a modification of the operation known as pulp capping. Needless to say, thousands of cases and an extended period of time will be required for any work along this line to give a reasonable degree of the expectancy of success for such operations. Pulpotomy

has recently received a rude shock from pathologists, and more from the same source may be in store in regard to some of the root canal operations now advocated.

Five operating outfits have been installed in the clinic at the Navy Dental School, with the idea of making practical procedures and applications of principles set forth in an integral part of the course. Each unit is fully equipped and represents approximately the facilities which are available in the standard dental equipments. Packages for sterile work are autoclaved once a week in sufficient quantities, the autoclave representing the medical facilities of the ship or station in this respect.

An endeavor is made to impress the principles of aseptic technic in root canal work, with the idea in mind that in all instances previous preparations have to be made with this end in view. Such work is out of the question unless a definite technic has been worked out and the necessary preparations previously made and instantly available. The molten-metal sterilizer is in this respect an appliance which could not be dispensed with. Prior to its advent asepsis in dental operations was, practically speaking, not within the reach of the usual dental office equipment.

Not a great deal can be said as to the treatment of pulpless teeth in which putrescence has occurred, other than an effort should be made to sterilize and fill with aseptic material, such as sterile gutta-percha. To go into the indications and contraindications for canal fillings, amputations, and extractions would be but to review current literature on the subject. Formalin and silver deposition are the only medicaments which have given satisfactory laboratory findings in producing sterility of the dentine. Formalin, however, has the well-known property of devitalizing all living tissue with which it is brought into contact, through the action of the formaldehyde gas in causing liquefaction necrosis. Pathologists therefore state that it should not be used where it can come into contact with vital tissue. Its use would therefore seem precluded on account of its permeation through the apical foramen as well as toward the peridental membrane. The deposition of silver as recommended by Howe has definite limitations in two respects: First, it causes an intense permanent discoloration of tooth structure which renders its use inadvisable in any tooth visible; and, second, the use of formalin as the precipitating agent frequently causes pain of such severe character as to make one very cautious in its use.

Professional responsibility in the military service is inculcated, and the greatest good to the greatest number has to be always borne in mind. In times of national emergency, when a great influx of recruits is encountered, military dental operations of necessity are

restricted largely to the relief of pain, extractions, and surgical attention.

Along the lines of preventive dentistry, the establishment and maintenance of contacts is given a prominent place, as is also the correction of the lines of force of occlusal stress as pointed out by Dr. Frederick A. Bricker in his work on that subject.

Hospital corpsmen are trained in oral prophylaxis and such mechanical work as they are considered competent to perform. In the past no provision has existed whereby dental officers have been able to utilize the services of trained assistants, due to the rotation-duty schedule in existence for all members of the Hospital Corps. It is the intention to assign for dental duty only members of the Hospital Corps who have received training at the dental school. Not only will they be able to assist at the chair, but will as occasion permits be assigned to operating chairs, where they can render oral prophylaxis. The number of dental officers is limited, and the additional work which can be performed by men thus assigned should result in the personnel of the service receiving more adequate dental attention. A limited number of laboratories are to be established, and to these will be assigned men graduating from the school who show an aptitude for this type of work.

The Surgeon General of the Navy is affording to every corps opportunities for instruction in the advancements of their professions, and the result over a period of years should be for the material betterment of service conditions.

PROSTHESIS.

The prosthetic course given at the school consists of full and partial denture construction, crown and bridge work, including various types of crowns and bridges, fracture appliances, and tooth carving, in addition to chemistry and metallurgy.

The technic used for full denture construction is the Tench-Clapp technic. This technic consists of full muscle trimmed upper impressions for which modeling compound is used, the lower impression being knife trimmed and corrected for muscular or functional freedom. All impressions are boxed and poured with Spence plaster. A careful study is made of the properties and behavior of compound and its manipulation. Facial length and restoration is accomplished by contour rims, and a careful study is made of face forms. In all full cases an anatomical articulation is worked out which includes the working, balance, and rest bites. The teeth are ground with copper-carbo powder. The trial dentures are festooned, invested, packed, vulcanized, and polished by both the student officers and corpsmen.



DEPARTMENT OF MINOR ORAL SURGERY.

10-1

10-1



X-RAY ROOM.

10-2





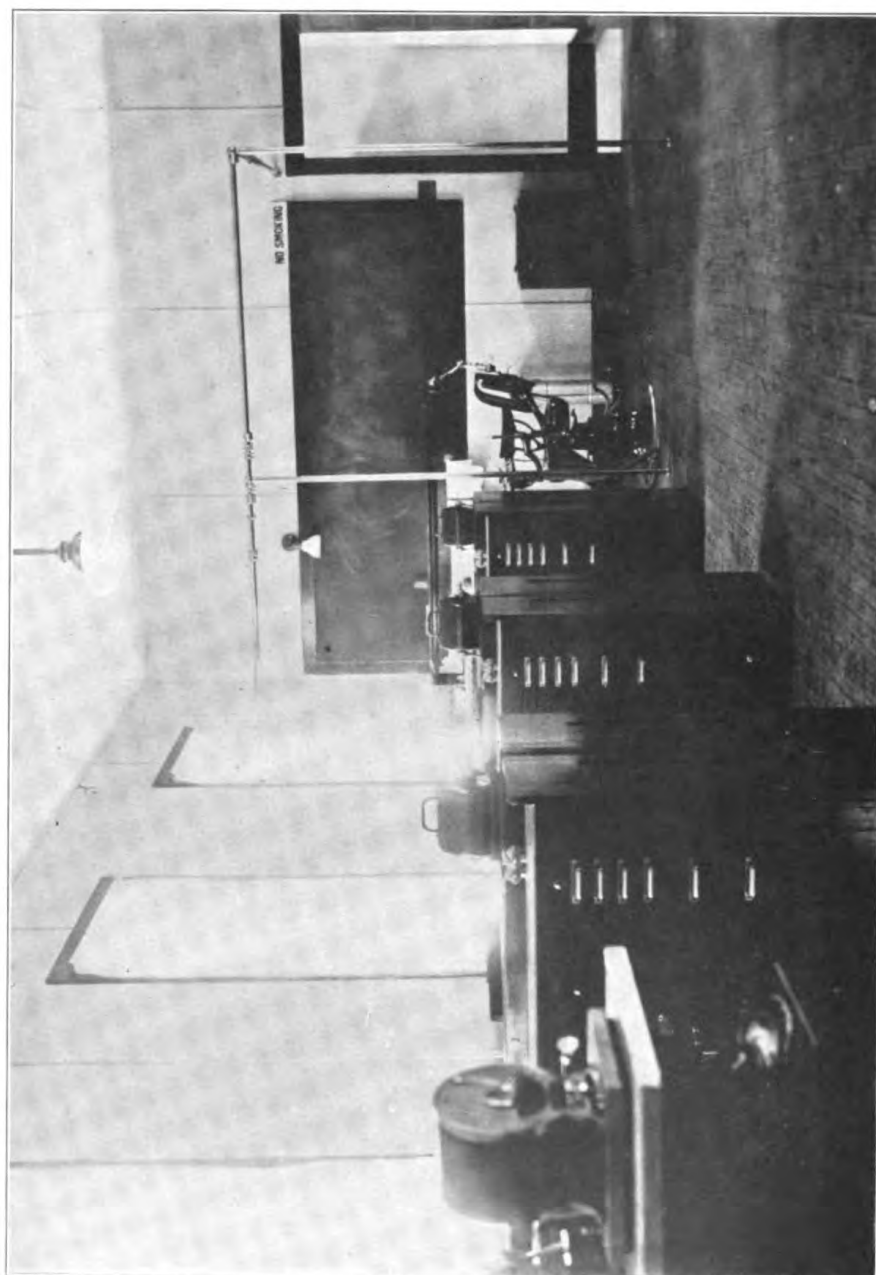
MAIN OPERATING CLINIC.

10-3



HOSPITAL CORPSMEN RECEIVING INSTRUCTION IN MECHANICAL DENTISTRY.

10-3



10-6



ADMINISTRATIVE DESK, MAIN OPERATING CLINIC.

10-7





A CORNER OF THE PROSTHETIC LABORATORY.

10-8



The course in partial denture construction consists of an estimation of the indications and contraindications for partial dentures, means of retention, various materials used in their construction, sectional compound impression technic for partial dentures, the construction of partial dentures, selection of teeth, investing, packing, vulcanizing, and polishing. The partial denture course consists also of a consideration of the indications and contraindications for the use of clasps which include the hand-bent clasp, cast clasp, cast clasp with stop, Dresch attachment attached to cast clasp, wire-loop clasp, etc.

The crown and bridge course consists of various types of crowns and bridges. The indications and contraindications for crowns and bridges are carefully studied. The types of crowns which are made are the two-piece all-gold crown for bicuspid and molars, the cast-cusp crown, the whole-cast crown, various types of Carmichael crowns using a shoulder at the gingivæ or tapering it to a feather edge, the so-called half-cast crown for bridge abutments, the cast-base Richmond crown, the cast-base Davis crown, and various others. The course in bridge work consists of fixed and removable bridges. On all fixed bridges a stress breaker of some sort is resorted to. Most bridges are constructed with tubular teeth, and those have porcelain facings; a root of porcelain is fused on the facing. Correct lingual anatomical contour is secured on all the ponts. Whenever possible and conditions permit, a sanitary bridge is constructed for the lower jaw. The removable-movable bridge work of Chayes's technic is also taught.

Special attention is given to anatomical tooth form by carving teeth in wax.

The cavity preparation taught for inlay and three-quarter crown abutments is the Black cavity preparation and the Carmichael, or modification of the Carmichael, preparation. All inlays and cast crowns are made indirect-direct. That is, a die is made from an accurate impression of the polished cavity preparation and the pattern is carved to suit the case. The pattern is then placed into the cavity for final adjustment and is never put back on the die. Careful attention is given to the manipulation of inlay wax, investing and burning out the wax from the flask, and casting.

The metallurgy course consists of a study of the metals used in dentistry, their properties and uses; also various alloys and amalgams and the recovery of precious metals from their alloys.

The student hospital corpsmen are being taught the manipulation of inlay wax, making amalgam dies, carving wax patterns to anatomical tooth form, investing, burning out the wax pattern, and

casting. They are also being taught to box and pour impressions; set up the casts on a Gysi simplex articulator with the use of a face bow; anatomical articulation; festooning the trial dentures; investing, packing, vulcanizing, and polishing these dentures; various types of clasps are constructed; also the repairing of fractured dentures, etc.

The corpsmen are given a course in elementary, nonmetallic chemistry which includes chemical laws, a study of the nonmetallic elements, their history, occurrence, preparation, properties, and uses. Also the most important compounds of these nonmetallic elements are studied.

The metallurgy course further consists of the study of the metals used in the laboratory, which includes their history, occurrence, preparation, properties, and uses of the various alloys and amalgams.

MINOR ORAL SURGERY.

The course in oral surgery has been designed to meet the general requirements of the naval dental surgeon with particular reference to his work in naval hospitals. It consists of a series of lectures in oral diagnosis supplemented by clinical demonstrations in minor surgery, the removal of impacted and nonerupted teeth, root resection, fractures, maxillary sinusitis, cysts, etc.

The importance of dentistry as a factor in group medicine is given thorough consideration, and it is one of the principal aims of this instruction to acquaint the dental surgeon with a knowledge of the value of his services in this respect. To this end methods of cooperation in general diagnosis and the relative importance of a thorough scientific knowledge in carrying out these methods is made one of the fundamental features of the course.

Careful attention is given to the general rules governing the treatment of all fractures; and the comparative value of various types of appliances commonly employed in fracture reduction is reviewed with special consideration to those types accepted as of particular value in the treatment of fractures at sea. The construction and emplacement of splints is taught in connection with the course in prosthesis.

The so-called surgical removal of abscessed teeth, in contradistinction to ordinary surgical extraction, is discussed at length in an effort to arrive at the relative value of these operations and when they may be indicated.

The primary aim of the surgical course is to review the anatomy of the head as applied to such minor oral surgery as the dental officer may be called upon to perform, and supplement such instruction as is usually taught in the dental colleges of the country by such modern

methods of technique in the treatment of cases calling for surgical interference as recent developments in dental science have proved of advantage.

PATHOLOGY.

This subject is taught at the Navy Dental School in a joint lecture and laboratory course which consists of a review of general pathology, with particular attention to oral pathology.

Attention is directed largely to those neoplastic and systemic diseases commonly manifested in the mouth, such as syphilis, tuberculosis, malignancies, etc.

Dental pathology is so far differentiated from general pathology in this course as to place special emphasis on the study and treatment of diseases of the gingivæ and peridental membrane.

Special sections have been prepared for use in the study of the peridental tissues, and a thorough knowledge of the histology and functions of the pericemental membrane as a specialized organ is provided for.

The laboratory facilities of the medical school are at the disposal of the dental students, and microscopes and specially prepared slides are kept at the school for clinical comparison and supplementary study.

The technic of surgical elimination of all pyorrheal pockets and a study of the results of this treatment as applied to the tissues involved is a joint feature of this course with the instruction given in oral surgical demonstrations.

DENTAL RADIOLOGY.

The adoption of the X ray as an adjunct to diagnosis in diseases of the oral tissues has probably done more to revolutionize the practice of dentistry than any other phase of its development.

The course given in radiology is a combined lecture-recitation-demonstration course, embracing a study of the principles of the X ray, a thorough knowledge of the X-ray machine and its method of assembly and operation, the technic of exposure with an exhaustive study of angles and their importance, of tubes and tube technic.

As the most important work of the radiologist is the correct interpretation of X-ray pictures and a study of the structure and pathological changes which may be shown in an effort to arrive at the proper diagnosis in questionable cases, special emphasis is placed on this feature of the course as given to student officers.

Hospital corpsmen are given the same instruction in general principles of manipulation of the machine, with special consideration of its care and a thorough training in developing, mounting, and other accessory features of the work.

Both medical and dental arms of the X-ray machine are used, and all phases of the work are given the exacting care that radiology requires in order to make it of value.

FOREIGN BODIES OF DENTAL ORIGIN IN THE AIR AND FOOD PASSAGES.¹

By Dr. Louis H. Clerf,² Philadelphia, Pa.

With an increasing frequency in the recognition of foreign body cases there has been a relative increase in the number of foreign body cases of dental origin that have come to the bronchoscopic clinic. A recent summing up of these cases³ show a total of 40 foreign bodies which include artificial dentures, teeth or fragments thereof, gold crowns, dental instruments,⁴ amalgam fillings, orthodontic appliances, and one gold bridge.

An analysis of the circumstances attending the occurrence of these accidents shows an absence of carelessness on the part of the dentist, and they can be classed as purely accidental. When one reflects on the enormous numbers of patients that are examined and treated by dentists and the comparative infrequency of these accidents, it is, indeed, a great tribute to the skill of the dental profession.

Artificial dentures in most instances were defective or badly fitting, and the patient very carelessly continued to wear them in that condition. The denture may become dislodged during sleep, anesthesia, epileptic seizure, or any condition producing unconsciousness, or when eating, and is then either swallowed or aspirated. Of the 12 cases, 11 lodged in the esophagus and 1 in the left bronchus.

Case Fbdy. 887 was swallowed while the patient was asleep. The denture was defective, having broken three years previously, and was worn constantly in this condition. Case Fbdy. 965, originally supporting three upper teeth which had been broken off 25 years before, was swallowed while eating. The plate was worn to protect the gums. Case Fbdy. 937 was swallowed while the patient was sleeping. It was defective, one of the hooks to hold it in place having been lost. Case Fbdy. 669 was swallowed when the denture broke while in the patient's mouth. Case Fbdy. 1107, a badly fitting denture, was swallowed while the patient was eating. Cases Fbdys. 1032 and 1074, both badly fitting, were swallowed during epileptic seizures. Case Fbdy. 773 was aspirated in the left bronchus when the patient, falling unconscious, broke his tooth plate.

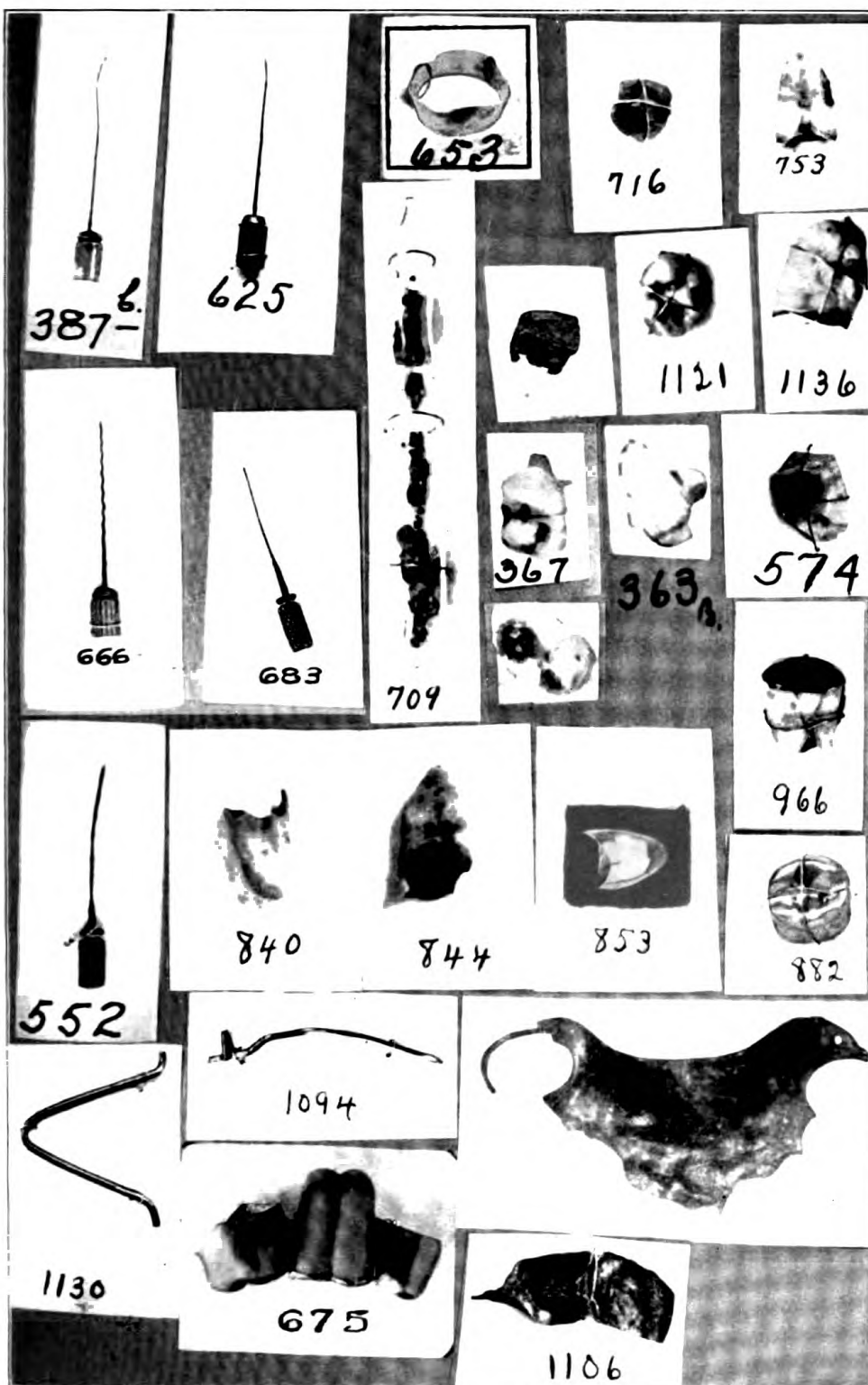
Aspiration of teeth.—Portions of a crushed tooth or even an entire tooth may be aspirated during exodontia, especially when a general

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² Formerly Lieutenant, Medical Corps, United States Navy.

³ Jackson, Chevallier. *Peroral Endoscopy and Laryngeal Surgery. Textbook*, 1914. Laryngoscope Co., St. Louis.

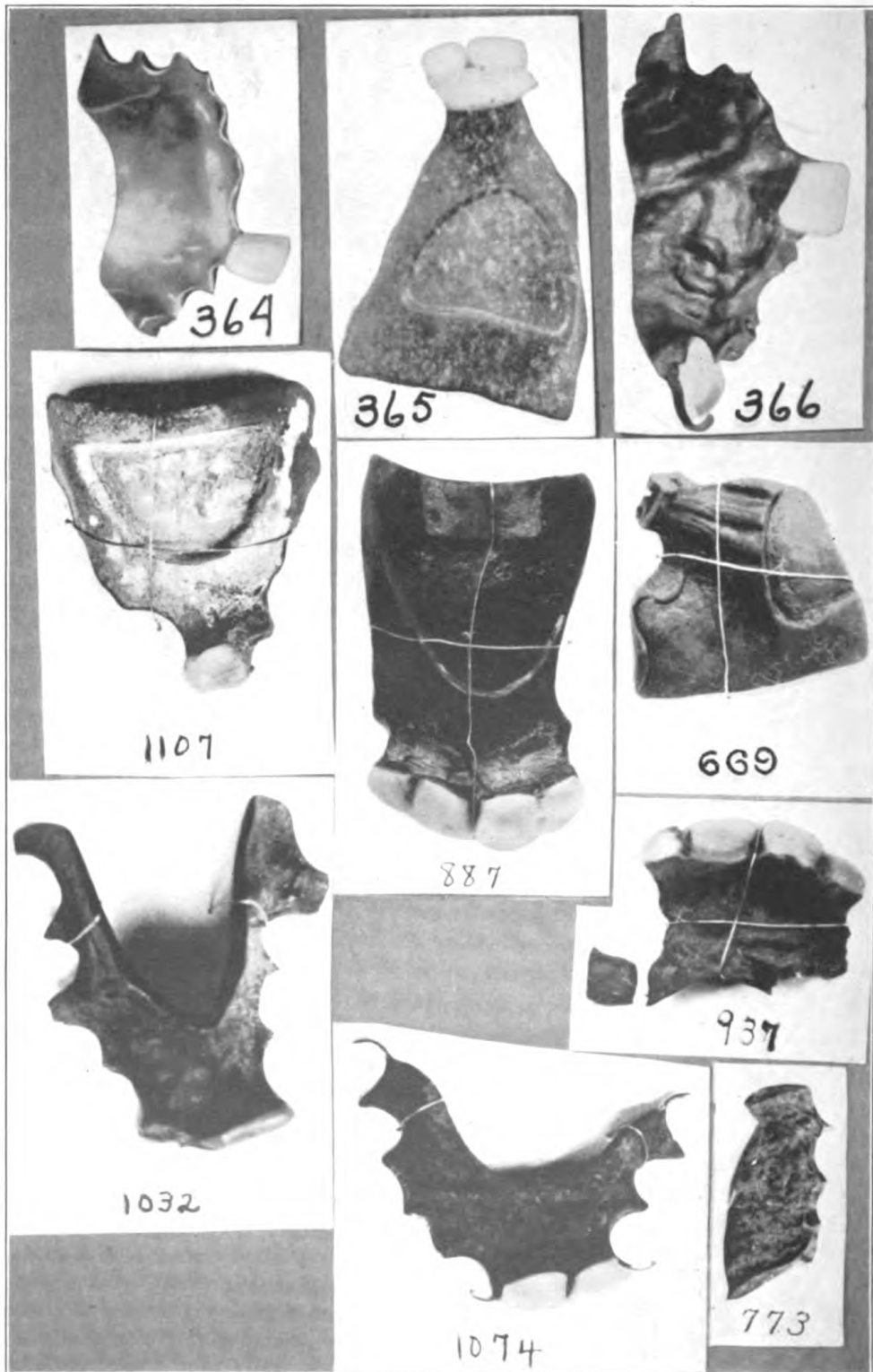
⁴ Jackson, Chevallier. *Observation on the Pathology of Foreign Bodies in the Air and Food Passages. Mütter Lecture*. 1917. Surg., Gyn. and Obstet. March, 1919.



FOREIGN BODIES OF DENTAL ORIGIN EXTRACTED FROM THE AIR AND FOOD PASSAGES.

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FOREIGN BODIES OF DENTAL ORIGIN EXTRACTED FROM THE AIR AND FOOD PASSAGES.

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anesthetic is used. The almost general use of the upright position,* combined with stertorous breathing during anesthesia, especially when nitrous oxide is used, are of etiological importance in this accident. In one case of tooth aspiration a local anesthetic was used. In the remaining nine cases a general anesthetic was given. Case Fbdy. 709 was aspirated during the extraction of 20 teeth under ether anesthesia. It was not recognized until five years after, that all the symptoms were due to a foreign body. Case Fbdy. 752 was aspirated in the right bronchus when 5 teeth were removed under nitrous oxide anesthesia. Case Fbdy. 844, a portion of a crushed tooth was lost during extraction under somnoform. Case Fbdy. 1121 was removed from the right stem bronchus three months after extraction of 2 teeth, and case Fbdy. 1136 from the right main bronchus two months after 10 teeth had been removed. Both cases were done under gas anesthesia. Case Fbdy. 840 was one of 14 teeth extracted under chloroform. Case Fbdy. 966 was lost when 19 teeth were pulled under gas anesthesia. It was missed immediately after operation, but was believed to have been accounted for later.

Gold tooth crowns.—In one instance—case Fbdy. 653—the band of the crown was accidentally lost while attempting to fasten it to the tooth. While attempting to loosen a crown—case Fbdy. 855—it suddenly sprang loose and disappeared in the pharynx. In another case—case Fbdy. 882—a crowned tooth was being extracted under gas anesthesia. The pharynx had been carefully packed off. The crown slipped from the forceps and disappeared, although the root was retained in the forceps' grasp. In these three cases the loss was accidental. It was recognized immediately, and with the Roentgen ray the foreign body was located in the right bronchus in two cases and in the left bronchus in the remaining one. Bronchoscopic removal was effected under local anesthesia.

Dental instruments.—There has been but one kind of dental instrument found as a foreign body in the bronchoscopic clinic, namely, a broach canal reamer. Because of its construction and the rotary motion imparted to it when used, an insecure grasp is afforded. This, combined with the sudden jumping of the patient, are contributory factors in the occurrence of this accident. Of the nine cases, all were aspirated into a bronchus. Among all the cases in which bronchoscopy was done there was but one case of failure to remove the dental reamer. This occurred in the early days of bronchoscopy, when all the aids to successful removal were not available. To-day removal in such a case could be successfully done.

* Jackson, Chevallier. Foreign Bodies in the Larynx, Trachea, Bronchi, and Esophagus Etiologically Considered. Trans. Sect. Larys., Otol. and Rhin., A. M. A. 1917. Pp. 36-55.

Amalgam fillings are usually lost during extraction, especially if the tooth is crushed by the forceps. Of the two cases noted, one filling—case Fbdy. 716—was lost and aspirated when six teeth were extracted under gas anesthesia.

Orthodontic appliances are often defective or are improperly applied by the patient. Case Fbdy. 1094 was lost in the pharynx while being adjusted. Case Fbdy. 1106 disappeared during an abdominal operation under general anesthesia. Its absence was noted by the patient, but it was not discovered in the left bronchus until 14 months after, when he was examined by the Roentgen ray on admission to a sanitarium for supposed pulmonary tuberculosis. Case Fbdy. 1130, a spreading brace, was swallowed while ice cream was eaten. The patient, who applied the apparatus daily, failed to properly secure one of the ends.

Gold bridge.—In this instance, case Fbdy. 675, a three-tooth bridge accidentally slipped while being fitted and was aspirated into the right main bronchus. Bronchoscopic removal under local anesthesia was done.

Conclusions.—All dentures should be kept in good repair and properly fitted. The mouth should be carefully inspected for dentures, loose teeth, and any loose corrective appliance before administering a general anesthetic, and the same precaution should be taken in all cases of unconsciousness. Persons wearing dentures should always remove them before going to sleep.

In exodontia, especially under a general anesthetic, packs should be properly placed to prevent aspiration of teeth fillings or crowns. Every tooth, fragment, or filling should be accounted for in the same manner as the abdominal surgeon accounts for sponges and instruments used before completing the operation.

Orthodontic appliances should be securely fixed in situ, as application by the patient is often carelessly done.

If there is any question about the loss of a tooth, appliance, or filling, careful Roentgen-ray examination of the chest should be immediately insisted upon. Only in this way can the reputation of the dentist be safeguarded and the interests of the patient served.

SURGICAL TREATMENT OF CHRONIC SUPPURATIVE PERICEMENTITIS.

By W. L. Darnall, Lieutenant commander, Dental Corps, United States Navy.

To successfully treat any diseased condition we must first have definite knowledge concerning its etiology and pathology, so in discussing the surgical treatment of chronic suppurative pericementitis, or, as it is more generally termed, pyorrhea, we will first consider the etiology and pathology of diseased peridental tissues.

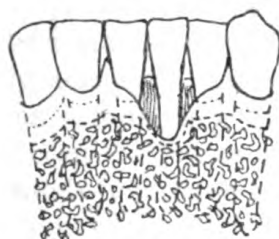


FIG. 1.—Method of eliminating pockets on the labial or buccal surface.

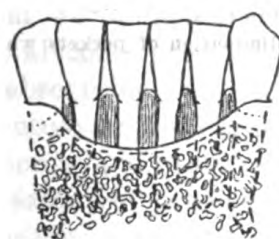


FIG. 2.—Incision made through the labial gum from cuspid to cuspid, eliminating all four pockets.

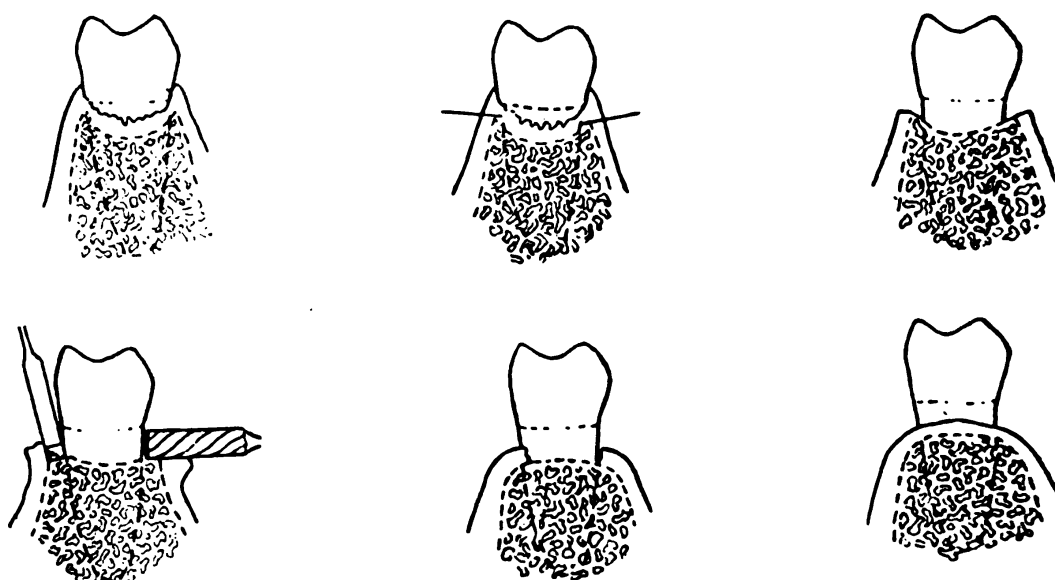


FIG. 3.—Showing elimination of pockets which encircle the tooth.

There has been a marked tendency in the past to consider a definite etiologic factor in chronic suppurative pericementitis instead of the correlation of all the influences which tend to produce the condition. Inflammation caused by deposits of salivary calculus alone was long held to be the true cause of this disease. Then the theory of bacterial origin came into vogue. It was held by many that the cause of this disease was primarily one of bacterial invasion, but nothing was ever proven to implicate bacteria as an exciting cause; nevertheless, the pathology is so closely associated with infection that we must recognize its importance as a secondary factor. Trauma and disturbed function also have been alleged causative factors. While it has been impossible to definitely determine any one etiologic factor as a whole, it is generally considered by the leading dental pathologists that these foregoing influences, such as trauma, irritation, metabolic disturbances, and microbic invasion, all constitute a vicious circle in the causation of suppurative periodontal diseases.

With the cause in dispute, the fact can not be denied, however, that chronic suppurative pericementitis always begins as a gingival irritation, followed by a breaking down of the floor of the subgingival space, exposing the adjacent tissues to infection and irritation, the changes which take place in the periodontal membrane representing a normal reaction to chronic irritation.

On account of irritation the fibers of the periodontal membrane within the area involved become swollen, and the swelling is followed by a disintegration of their substance, a breaking down of their continuity and liquefaction. The vessel walls of the membrane become thickened and finally obliterated. Then an osteoclastic action begins throughout that portion of the alveolar process supporting the fibers which have become detached. In this connection G. V. Black calls attention to the fact "that we might expect the fibers of the periodontal membrane and the alveolar process to disappear as a purely physiological process of absorption following the severance of the membrane from the cementum regardless of continued progress of pathologic invasion." Microscopic examination of the affected tissues at this stage shows extensive projections of the gingival epithelium into the submucous tissue, and at times this epithelium grows down to the new line of attachment of the fibers, with the cementum forming a new gingiva.

Probably the most important factor in the pathology of these so-called pus pockets is the denudation of the cementum. As a result of these suppurative processes with subsequent detachment of the periodontal fibers from the cementum, the cementoblasts within this area are exposed to the irritation of bacterial invasion and die. The denuded cementum, being very porous, readily absorbs toxins,

thereby rendering itself negative to any reaction the living cells within the overlying tissue might show toward a reattachment.

The aim of treatment has been an effort to secure the reattachment of the soft tissues to the cementum of the tooth and the treatment based more or less on the symptoms presented has led many in their enthusiasm to believe that by removing local irritants and applying local remedies a cure could be obtained. Hence many have directed their efforts along this line.

This is particularly true in their attitude toward well-established pockets. In undertaking a treatment with the hope of securing reattachment of the periodontal fibers to the cementum, scaling of the cemental surfaces has long been held the only logical procedure, losing sight of the pathological changes which the different tissues undergo. The cementoblasts having died, the pus-soaked cementum may be considered analogous to necrotic bone tissue, and any curetment of its surface with the hope of securing reattachment of the soft tissues to its surface is like attempting to produce a reattachment of the sequestrum of necrotic bone.

The theory that localized infections about the roots of teeth may be a dominant factor in the production of secondary systemic infection has been generally recognized for some time; and as the important factor in the treatment of any systemic complication depends on the early removal of the focus, the elimination by surgical means of these pus pockets which are a constant menace to the health is but a logical and sane treatment.

The method of treatment about to be described is practical and is not of such a surgical nature as to be considered beyond the scope of the average dentist. True it may be claimed that the basis for this procedure was laid down by Riggs years ago, but in those days there was no definite knowledge of the pathology and very little known as to the real cause. It remained for Black and his associates to revive the principles of the treatment, but only after extensive research into the histo-pathology of the condition and arriving at some definite conclusions as to its etiology.

A general survey of the case to be treated should be made. This consists of a thorough examination of the gingivæ and supporting tissues, supplemented with radiographs of the entire denture.

The depth of the pockets are determined by using a very thin flat explorer with rounded edges, angled so that it conveniently passes down between the gum and the teeth as far as the membrane is detached. As some of the severest forms of this disease begins in the depth of the subgingival space and are not visible to the eye until more or less destruction of the tissues takes place, it is important as a preventive measure that we determine the presence or absence of

pockets in positions where the investing tissues of the teeth appear to be normal.

In differentiating between those teeth where extraction is indicated and those for surgical treatment, it must be remembered that the deeper the pocket the less attachment of the membrane and greater is the indication for extraction. The important factor in the immediate success of this operation is the remaining amount of attachment, and we must carefully judge those teeth where the detachment has progressed beyond the middle third of the root, for usually in their case the result is inevitable.

Black in his treatment of this disease divides the cases which present themselves to the dentist into three groups: First, those in which the pockets are on the labial or buccal surface; second, those involving the proximal surface; third, those wherein the pocket encircles the tooth. In all cases we endeavor to accomplish two things, i. e., to remove all overlying tissue to the depth of the pocket exposing the root and to protect the exposed edges of process by trimming it slightly lower than that of the gum tissue so that the latter will overlap the bone, thereby promoting healing and preventing necrosis of the bony structure.

In operating on those included in the first group the incision is made along the line of a gradual curve to the bottom of the pocket. All tissue is removed and the root exposed; then, holding the gum tissue back, the operator trims the crest of the alveolus just below its margin, allowing the gum to fold back over. We find in considering pockets on the labial side of the upper incisor that their depth will sometimes contraindicate treatment, on account of the appearance of the exposed root. Pockets on the lingual side of the upper teeth are less apt to give good results, on account of the heavy process which, when trimmed, forms a shelf next to the tooth.

In cases of the second group, with pockets on the proximal surface, we will have to remove both hard and soft tissues on the labial and lingual surfaces to the depth of the pocket. Take, for example, the six lower anterior teeth. Starting our incision at the distal border of the left cuspid we bring the incision across the gingiva, curving it gradually, using the deepest pocket as our objective, then bringing it up to the border of the opposite cuspid, endeavoring to include in the line of incision the base of all pockets. This procedure is repeated on the lingual side. As destruction of the soft tissues always takes place in advance of the absorption of bone, we find it necessary not only to trim the alveolus in order to allow the gum tissue to fold over the crest of the bone but to remove the diseased tissue in the interproximal space, thus leveling the base of the pocket to facilitate the growth of epithelium across the space.

After making our incisions we take a Black's chisel of convenient angle and, using the incision as a guide, force the blade through the thin bone of the alveolus. This is repeated at each tooth; then with an upward scraping motion both hard and soft tissues will be removed. Next with a thin-bladed chisel we remove all granulation tissue, together with the necrotic bone within the interproximal space, making sure that we eliminate all portions of the pocket and smoothing off the surfaces with either chisels or burs. Care must be exercised in using burs, however, not to injure the tooth structure.

In group 3, or those cases in which the pocket encircles the tooth, the treatment consists of removing the soft tissue and trimming the edge of the bone with a chisel as in the preceding groups. In extensive involvements of this type it is best to divide the mouth into two, three, or even four parts, operating each at different intervals.

The after treatment consists in irrigating the area exposed with warm salt water until bleeding has stopped. Eliminate as much as possible the organizing of a blood clot. This lessens the risk of infection and permits the epithelium to cover over the exposed space much more rapidly. The patient upon being dismissed should be instructed to use a warm salt-water solution as a mouth wash, forcing the liquid back and forth through the spaces, thereby dislodging the food debris and mechanically cleaning the areas. The teeth will be slightly sore for some time and will respond quickly to thermal changes for a few days, but this discomfort gradually wears off. Only in one case of the many operated upon at the Northwestern University Dental School was it necessary to relieve the sensitiveness by the use of silver nitrate crystals.

In advocating this method of procedure it is felt that it is especially adapted for use in the naval service. The operation is completed within a short time, all pus pockets are eliminated, very little after treatment is necessary, and the results are satisfactory. The general care and cleanliness of the mouth are easily maintained, and the infection can be overcome rapidly.

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MANIPULATION OF AMALGAM.

By H. E. Harvey, Lieutenant Commander, Dental Corps, United States Navy.

The subject of the manipulation of amalgam is one which is of the utmost importance to the general practitioner, and it may be interesting to know that competent authorities assign relative values to the metal filling materials in common use as follows: First gold foil, second amalgam, and third gold inlays. There are places, of course, where inlays are indicated on account of factors which will readily present themselves to the mind, but the above is the result of observation and thought by careful technicians who are qualified to judge and whose judgment must be given consideration.

In common with most any material, amalgam restorations may be a menace to the integrity of the tooth, provided a knowledge of its properties are not borne in mind and the principles of its manipulation are not mastered. It may seem to the uninitiated that nothing could be simpler than the incorporation of mercury with the alloy as furnished by the manufacturers and the placing of the resultant mass in the cavity. Nothing original is claimed in the presentation of the subject herein, but familiarity often leads to contempt, and so daily manipulation of materials without an occasional check up may lead one into changes in technic which may very materially affect results.

Fortunately for the profession, manufacturers supply alloys which conform to the scientific requirements set forth in 1895 by Dr. G. V. Black, when he gave to the profession the theory of the "balanced alloy." His work explained the reasons for the lack of uniformity of results which would be obtained under the same conditions with alloys of exactly the same percentage formulæ at different times. In fact, his researches have removed the stigma formerly attached to amalgam restorations, and to-day under proper manipulation it proves in many cases the ideal material. He showed how to balance the composite metals of the alloy by counteracting the expansion of one by the contraction of another, how to control the flow, and by annealing to artificially age it so that the setting could be controlled. The second volume of his *Operative Dentistry* contains his experiments and the conclusions reached, which will not be dealt with here in detail.

Zinc is regarded by some as a factor in alloys which can not be definitely controlled, but it is significant that a small percentage of this metal is contained in those which enjoy the highest of reputations and which in unbiased scientific tests have proven to fulfill the most exacting requirements.

A few words on the properties of the elements which compose alloys may help to an understanding of the technic of manipulation

and insertion. Silver contributes expansion and strength; tin contributes contraction and easy working; copper contributes unchangeability and strength; zinc contributes toughness. The last three may well be considered as modifiers for the silver and, being base metals, as necessary evils. The properties of silver are such as to render it unsuitable for the purpose without modification.

Mercury has a decided affinity for tin, almost similar to that of blotting paper for water, while its affinity for silver, copper, and zinc is so much less that upon adding mercury to a mixture of these metals it at once unites with the tin and will incorporate with the remaining metals only with difficulty. Here we reach the first most important step in the proper manipulation—that of *forcible* trituration in the mortar. An important addition to the dental cabinet is a three-minute sand glass. After the mercury is added to the filings in the mortar, the glass is inverted and forcible trituration is made for one minute and a half, or until half of the sand has run through the glass; a psychic factor, perhaps, is that with the end of the time in sight, more forcible pressure will be exerted on the pestle and a more thorough incorporation of the metals effected. This can not be neglected when the fact is borne in mind that the mercury has a decided affinity for the tin and much less for the other metals present. The result to be desired is that during a minute and a half the mercury be made to unite with all the particles of the silver, copper, and zinc as well as with the tin.

We hear of weighing the proportions of alloy and mercury, but by experience it has been found that this is not essential; an excess of mercury is necessary, but in this reason must be used. The alloy will take up only so much mercury, the remainder being present to form in excess a sloppy mass. Excess mercury is removed by pressure, and the point has here been made that in expressing it the balance of the alloy may be disturbed, and this in fact is a possibility if a thorough incorporation of all metals present has not been made. For instance, with weak-kneed trituration the mercury may have united with all of the tin and only a portion of the other metals, and logically an expression of the excess from such a mix would be expected to disturb the balance. However, if a proper mix is made, experiments have shown that the metals have been removed in practically the same proportions as they exist in the alloy. All this, however, is not to the effect that more mercury should be added than is required to make a uniformly easily plastic mass without evidence of sloppiness. Mercury is added as desired to produce a mass which presents a highly polished, smooth, lustrous surface, which sticks to the mortar as trituration proceeds and just falls away from the sides of the mortar a little as it is jarred. After a minute and a half the

plastic mass is transferred to the palm of the hand and mulled, not rolled, with the thumb of the other hand; that is, it is pressed out with a pulling motion to flatness, and this is continued to further incorporate the metals until crepitus is felt. If the proportions of alloy and mercury are right the mass should make a smooth mix which will take a good impression of the lines on the fingers without being sloppy; should be capable of being rolled into a long, slender roll without much breaking; and lastly should not change form when kneaded into a ball. This final mixing may be done in a rubber finger stall or otherwise as desired.

At this place may a simile be given? When it is desired to work metals they are heated to fluidity with a blowpipe, and if it is desired to retain this molten state it is necessary to keep the heat of the flame on the metals. For the sake of comparison, the mercury may be considered as the blowpipe which is keeping the metals molten; and as half of the mix is to be kept plastic to complete the last portion of the filling, the mass is divided into equal parts, and to one is added a little more mercury; this is mulled and laid on one side, so to speak, in the molten state. Any remaining excess is expressed between the thumb and finger from the other part and it is ready for immediate use.

The matrix having been previously adjusted, the first portion of the mass, or that which has had the excess removed, is used to make the first portion of the filling, using medium-sized pieces. If in place of this plastic mass a small piece of sponge saturated with water were placed in the cavity, what would happen when force was applied with the face of a plugger? The water would be expressed toward the sides and would come up over the plugger point; and while the sponge would be confined under the plugger, the water would escape by the margins or over the plugger. Bearing in mind that the mass with which we are dealing has still an excess of mercury incorporated in it, the same thing will happen as we force the plugger on the amalgam placed in the cavity; the mercury will be forced away from the mass directly under the face of the plugger and toward the sides of the cavity and the margins. Now, it so happens that these are the very places in the filling which should contain a material which will set and become hard, which is not the case when amalgam contains an excess of mercury. For instance, should large, round, broad-faced pluggers be used during the packing, the force of the pressure being transmitted directly under the plugger will condense the mass there and leave it weak at the margins, it being impossible to adequately approach the margins with such a plugger. When an attempt is made to do so it results in forcing the mercury toward the places where pressure can not be brought to bear; that

is, in angles and cavity margins and sides. The ideal condition is one in which all the excess mercury is forced toward the top or open part of the cavity, and this is what is attempted. Pluggers are selected, Black's by preference, which offer a variety of suitable shapes, and from these one is taken which will most accurately fit into the angles and will when the position is changed entirely cover the gingival margins. With the sponge in mind we press the plugger firmly down through the mass, intent on condensing the mass directly under the face of the plugger; this pressure is made with considerable force, and as the downward pressure is completed it is held there for a momentary period to allow the mercury to escape toward the open part of the cavity. The angles, margins, and walls are successively packed down with strong, steady pressure, no tapping, and the plugger left momentarily as the material is condensed beneath it. Several pieces are added, usually the first half of the mix, which should half fill the cavity, or a little more. When this has been correctly done the entire surface of the material which is exposed to the opening of the cavity will be found to consist of a very sloppy mix which will contain all excess mercury. This is removed with a suitable instrument, excavator or what not, until the firm material underneath is reached. A test made at this point by using great pressure on a small-faced instrument should result in no more than a dent being made in the amalgam in the cavity; in other words, the entire mass remaining in the cavity should be hard, firm, and practically free from excess mercury. As the margins and gingiva have been condensed, a slight excess of mercury may have been expelled between the matrix and the tooth, but the majority of it will escape by the surface.

After the softened surface of the filling has been removed and a hard dense mass has been reached, that portion of the original mix which was laid aside is now used in exactly the same manner, expressing between the thumb and the fingers any excess which can be so driven off. The same forceful steady strokes of the plugger down through the material are repeated until the occlusal margins are reached. The mouth of the cavity or exposed surface of the filling, as it now is, will be found to be covered with very soft filling material; this is removed and more of the original mix is added. While condensing in the cavity, the walls and matrix have served as a means of confining the pressure, but the resistance of these is lost when the occlusal surface is reached. Were the filling to be finished by merely removing the excess of softened material, we would find that the margins contained a mixture in which too much mercury was present. The material would set after a fashion, but would never become hard and dense, thus leaving the filling weak at

one of its most important points and depriving the amalgam of its edge strength. To compensate for lack of retaining walls, the technic is changed a little at this point by taking the remainder of the mix and forcibly expressing in chamois skin with pliers any material which can be driven off. This mass is then divided into several pieces and is wafered on the surface of the filling; that is, a portion is flattened, placed on the filling adapted with a broad-faced plugger, and over this a large smooth instrument or burnisher is placed and the handle of this instrument tapped lightly sideways with another small instrument. This has the effect of bringing into the very dry mass on the surface of the filling any near-by mercury, which is necessarily derived from the surface and margins of the filling beneath. This is repeated a time or two and the filling is then ready for finishing. The result of the above technic is a filling of such strength that it can not be crushed or broken with any force which the fingers can bring to bear upon it with an instrument, but, strange to say, it can be carved or trimmed without effort by using a cutting instrument.

If a filling is placed in the manner described without previous separation of the teeth, it is useless to attempt to restore contact, because the filling material can not be burnished or pushed down after the matrix is removed; it can be carved with ease, but otherwise its form can not be changed.

Separation, either previous or immediate, is essential in the construction of fillings with the above technic when contacts are to be restored, and without them the filling, however well inserted, must be classed as a failure. The choice of election in the matter of separation for amalgam fillings seems to be immediate separation with the Perry separators. These have a double bow and are constructed so that they will not slip toward the gingiva; if the teeth are short, a piece of base-plate gutta-percha should be softened and placed on the occlusal surfaces of the teeth as rest for the bows. A most valuable feature of their construction is that they are adapted to securely hold against dislodgment matrix steel which should be cut and fitted for each tooth. Details of the preparation of matrices for this purpose are set forth at length in Doctor Black's book, mentioned in the fore part of this article. Just a word here regarding the sterilization of these separators. Boiling is to be preferred, but it is questionable if this would prove satisfactory, due to the threaded portion of the appliances becoming water-logged, with subsequent rust formation. They should work easily and freely when the wrench is applied, and failure to thoroughly dry and oil the threads after each boiling would soon result in their becoming useless. Some operators doubtless discount this possibility by not

sterilizing them. Saturating them with alcohol and burning it off is recommended; with a touch of oil to threads, after each sterilization, this should prevent them from binding.

Not only do the Perry separators establish and maintain separation during the operation but they relieve strain on the periodontal fibers to a large extent by lifting the teeth slightly from the alveolus when properly adjusted. They also will tighten up on loose contacts between adjacent teeth, thus a filling may be inserted which will restore the contact of the tooth in which it is placed and maintain contacts between the adjacent teeth. Contacts are so often reduced in mature adult life through abrasion of tooth surfaces during normal mastication due to individual tooth movement; also this may occur as the result of traumatic occlusion, and, last but not least, bodily movement of adjacent teeth or drifting, as it is termed, may have resulted from the existence of the vary carious area which is being cut away and filled.

The details set forth above go for naught unless a properly balanced alloy is used. Shrinkage is absolutely contraindicated, and to avoid this alloys should be used which show an initial expansion of not more than three ten-thousandths of an inch. This slight expansion is considered advantageous, as it locks the filling in the cavity so tightly that space for bacteria to enter does not exist around the margins. The use of such an alloy when properly inserted also prevents discoloration of tooth structure, as in the past the most prolific cause of this annoying factor has been found to be an improper adaptation of the filling material to the cavity walls and margins either through a poor operative technic or the use of a low-grade alloy. The Navy supplies a balanced Black alloy, so that one factor in a careful technic is cared for.

Dr. Thomas P. Hinman some years ago conducted a series of tests of the manipulation of amalgam by sending to prominent dentists in different parts of the country prepared cavities and asking them to fill these with amalgam according to their usual procedure and to return them to him for tests. He failed to find a filling which was so accurately adapted to the cavity walls that it would withstand a few pounds of air pressure without leaking. The conclusions reached were that all who had inserted fillings for the tests used the amalgam too dry, or, in other words, that from which too much mercury had been expressed before the material was packed in the cavity. To overcome the defect he advocated a technic resembling that given in this paper.

Insert the filling, taking advantage of its plasticity and adaptability, and then remove the excess mercury. A filling placed according to the details set forth will be a revelation to those who have not practiced this method or seen it demonstrated.

THE RELATION OF MODERN DENTISTRY TO GROUP DIAGNOSIS AS CONDUCTED AT THE NAVAL HOSPITAL, SAN DIEGO, CALIF.

By L. C. Montgomery, Lieutenant, Dental Corps, United States Navy.

The dental surgeon who aims to practice successfully preventive dentistry should not only be well grounded in his own special branch but should have a good working knowledge of general medicine, in order that his attention may be directed to hidden foci of infection connected with the teeth which may be responsible for an obscure pathological condition in some distant part of the body.

The danger which may lurk in a hidden dental infection is not fanciful. Dr. Lewellys F. Barker, of Johns Hopkins Hospital, speaking in this connection in reference to *Streptococcus viridans*, said: "I have personally observed 20 cases of viridans endocarditis, and every one of the patients is dead." So we may see the dental surgeon has a grave responsibility in treating infections of the teeth.

In a paper read before the Chicago Dental Society in 1913, Dr. Charles H. Mayo remarked: "The next great step in preventive medicine must come from the dentists. Will they make it?" Following this hint there came a deluge of extracted teeth—good, bad, and indifferent—removed without serious study and before the development of the diagnostic methods available to-day. Naturally there occurred a reaction, in which there was a tendency to refrain from dental interference until systemic conditions justified the removal of the teeth. The tendency to-day is to endeavor to make an early diagnosis, and if the pathological condition of a tooth points to an unfavorable prognosis prompt removal is indicated.

A great deal can be done, however, to preserve a tooth by proper treatment. By cleaning out and filling all cavities and smoothing the margins of restorations much infection may be removed and even cancer of the tongue prevented. Teeth properly treated may remain in a sound condition for years. This fact was recently pointed out by Dr. U. G. Rickert, of Ann Arbor, Mich., who, in an address before the New Jersey State Dental Society in May, 1922, said: "We have convincing evidence that properly treated teeth may remain aseptic for many years, having cultured cases that were found aseptic at the apices many years after treatment."

Treated teeth should be frequently examined by the X ray and subjected to a pulp test by heat or preferably electricity. Teeth which are clinically sound and show no defect when examined by roentgenography may be found to be nonvital by the pulp test. Transillumination of the teeth and adjacent structures will frequently throw light on pathological conditions. Treated teeth—that

is, those which have been subjected to conservative pulp surgery under aseptic conditions—in which the apices are not denuded and which contain a well-inserted root canal filling passing into but not through the apex and which resemble adjacent healthy teeth in that there is no destruction of the surrounding tissue should be considered healthy. However, as root canal filling is a preventive and not a curative procedure, these teeth require frequent inspection.

Grievess places those dental diseases which may become a starting point of general infection into two broad groups, (a) gingival and (b) pulpal and apical. In connection with the gingival he remarks: "All teeth hopelessly undermined by loss of attachments should be removed," and, in speaking of the other group, he says: "Because of certain histo-pathological facts diseased apices, said to be comparable to infected bone sequestræ, can not be exfoliated like these infected bone areas, but are retained by healthy middle and gingival third attachments. Hence apical abscesses involving subapical bone are not cured, like osteomyelitis, by free drainage and removal of a sequestra. Once this labyrinth is engorged with cocci its sterilization is impossible except by such powerful germicides as produce apical necrosis and involve the attaching tissue in apical disease."

Doctor Barker informs us that: "The method of procedure at Johns Hopkins Hospital is to study the mouth in all cases of arteriosclerosis and of arterial hypertension in order to detect there any source of infection that may signify danger. They do that not only in the cases here mentioned but in every patient who comes for diagnostic study. A report from an expert dental diagnostician is considered, with other accumulated data, before the final diagnosis is made." Dr. Frank Billings states: "To investigate and manage these patients [suspected of possessing foci of infection] requires the teamwork of the clinical and laboratory workers. The clinician must carefully examine the patient, exhausting every detail in personal history. The skill of the dentist, the nose and throat specialist, the gynecologist, the genito-urinary expert, and others may be necessary to locate the foci of infection. Each focus must be destroyed."

The conclusions of the workers in the Mayo Foundation in this regard are that all teeth showing definite pathology should be sacrificed, and that every patient admitted to the hospital should have a complete oral examination. Thus we see that the dentist has an important place in "group practice."

The following cases illustrate how the dentist may be of great assistance to the physician and the surgeon in connection with the eradication of foci of infection in or about the teeth which are the source of a general infection.

Case 1.—Arthritis: For the past four years the patient had suffered from pain, swelling, and stiffness of elbows, knees, ankles,

and wrist joints. When he came under observation the head of the first phalanx of the right great toe was swollen and painful. Tonsils had been removed. A careful examination by other members of the diagnostic group revealed no focus of infection which could be considered responsible for the condition. The dental examination revealed infection of four impacted molars and areas of pyorrhea about the upper and lower anterior teeth.

Following the extraction of the impacted molars and treatment of the pyorrhea there was a gradual subsidence of the joint symptoms. The patient was discharged from the hospital well six months ago and has had no return of his trouble.

Case 2.—Arthritis: In February, 1919, the patient began to have pain and swelling in the right ankle which troubled him from time to time for two years. On admission to the hospital the ankle presented the symptoms of a severe arthritis. The general physical examination was negative. Dental examination showed roots of teeth Nos. 3, 4, and 14 present and teeth Nos. 13 and 31 nonvital with radiolucent areas. The roots and teeth were extracted and a short chain streptococci obtained on culture. Following the extractions the condition in the ankle subsided, and the patient was finally discharged from the hospital cured.

Case 3.—Suspected chronic pulmonary tuberculosis: The patient on admission to the hospital complained of cough, night sweats, loss of weight and strength. Had never noticed expectoration of blood. A physical and an X-ray examination of the chest revealed no evidences of tuberculosis. Tubercle bacilli were never found in the sputum. The dental examination revealed eight infected teeth, which were removed. Cultures from these teeth showed the infecting organism to be a chromogenic, short chain hemolytic streptococci. Following dental treatment there was rapid improvement.

Case 4.—Suspected chronic pulmonary tuberculosis: No evidence of tuberculosis or syphilis found on physical and X-ray examination. Two infected roots were removed from under bridges, and four infected teeth were removed. Following the extractions the patient gained 11 pounds in 37 days, cough and night sweats disappeared, and temperature became normal. He was discharged cured.

Case 5.—Goiter: Examination showed very slight enlargement of thyroid gland, accompanied by slight tremor of extremities. Slight exophthalmia and tachycardia. Pulse rate 116 per minute; after exercise, 136; two minutes later, 116. No subjective symptoms. X-ray report: No evidence of substernal thyroid gland.

Dental report: Both lower first molars nonvital and canals not properly filled. Both lower third molars impacted and show infected areas. Upper right first molar nonvital and granuloma present.

Cultures from first molars and areas around the third molars positive for short-chain streptococci. Wassermann negative, as were other reports from various departments.

The infected teeth were extracted during February, 1922; and at the time of his discharge from the hospital, March 23, 1922, the following entry was made in his health record by his ward medical officer: "Operative interference not indicated. Since extraction of infected and impacted teeth, with accompanying rest, the thyroid symptoms have shown marked improvement and the patient states his condition does not bother him."

Case 6.—Psychoneurosis: History—broncho-pneumonia 1917; complete recovery; rheumatism January and February, 1919. His present trouble started in 1918, with pain in lower part of back and right side and continued to get worse until he was sent to the hospital.

Present complaint: Back hurts when patient attempts heavy lifting. Is nervous and has palpitation of the heart and a fine tremor of head and upper extremities. Also a tremor, but not so marked, in lower extremities. Experience sharp knifelike stabbing pains in epigastrium.

Examination showed head normal; pupils equal reaction to light and accommodation. Tongue protrudes straight, throat and thyroid negative. Deep muscle reflexes normal. No Romberg. Abdominal and cremasteric reflexes normal. Abdomen negative; Wassermann 4 plus; urine negative; and oral examination discloses an advanced stage of pyorrhea. Cardiac enlargement, aortic and systolic lesions, complains of precordial pain, nervousness, loss of weight and strength. Lungs—fine râles, increased respiration. White blood count 15,000, differential; 68 per cent polymorphonuclear, 1 per cent eosinophiles, 30 per cent lymphocytes, 1 per cent large mononuclear.

Treatment: The patient was given eight doses of salvarsan, after which the Wassermann reaction became negative. Following this, all teeth were extracted. The bone tissue was so necrotic that under the most careful manipulation the entire floor of each antrum was carried away during extraction of upper teeth. It was necessary to fill in soft tissue by a plastic operation to keep food from backing into the antrum. When this patient was first examined he was bedfast, weight 96 pounds, and unable to turn over, with apparently a multiple arthritis. Following extraction of all teeth, the arthritis disappeared, the patient gained 29 pounds, and the aortic lesion was imperceptible with only a slight systolic murmur.

Case 7.—Toxic amblyopia: Three months before admission to the hospital the patient noticed rapidly diminishing vision in the left eye. On admission, his Wassermann test was negative, and the left eye presented a complete ciliary paralysis with a low-grade

retinitis. The iris was completely dilated, and he had only light perception. The dental examination showed four impacted third molars, Nos. 19, 20, and 30 missing, and all the remaining teeth infected, except the lower cuspids and incisors. Extraction of the infected teeth was performed, together with removal of infected processes and curettage of cysts. Following this procedure there was rapid improvement in the condition of the eye. In 10 days large objects were discernible, and at the time of his discharge from the hospital he could count fingers at 5 feet.

TROPICAL DUTY AS PREDISPOSING TO GINGIVITIS.

By P. S. Tichey, Lieutenant, Dental Corps, United States Navy.

While stationed at Guantanamo, Cuba, during the late war I had occasion to observe an unusual condition of morbidity in the investing tissues of the teeth and gums of patients referred to me for treatment. This condition was so prevalent and so remarkably uniform in type that it served to interest me professionally to the extent of compiling certain records in an attempt to account for its presence.

The clinical picture presented in these cases was somewhat similar to the advanced stages of pyorrhea alveolaris, but differed from the usual manifestations observable in pyorrhea in that there were no typical pockets, demonstrable as such, and pus and the débris of an active and destructive bacterial infection could not be as readily expressed by the usual methods.

The pronounced hypertrophy of the gum tissue and the fact that there was much pain while the tissues were relaxed served to distinguish the condition as unusual, and occasionally it was noted that the gum tissue was of a faint blue color but without apparent localized areas or any identifying lines.

The patients invariably complained of a puffiness of the gum that was extremely uncomfortable, and generally the teeth were loose while apparently retaining all fibrous and membranous attachments.

Microscopical examination of smears made revealed the presence of the usual organisms found in the mouth, and spirochetæ were sometimes demonstrated.

Had I been able to demonstrate the fusiform bacillus with any of the associate spirilla which are present in Vincent's angina the diagnosis and treatment of these cases would have been greatly simplified, as the clinical symptoms, particularly the fact that there was always a considerable amount of pain and fetor, would have supported this diagnosis. These, however, were absent, and there was also an absence of the typical lesions associated with this form of infection.

Pyorrhea was, of course, immediately considered, but was not thought sufficient to account for the apparent widespread nature of the infection, and as there was present always local pain without trauma and a lack of gingival pockets generally associated with the advanced stages of this disease this theory was not tenable.

The various oral infections with which my practice has made me familiar were reviewed in the light of the clinical evidence presented, coupled with symptoms and history of each case, and each was eventually discarded.

Proper laboratory facilities not being available for extensive investigation, I made attempts to clear up these cases by palliative methods designed to make the patients as comfortable as possible in the hope of arriving at some specific and regular technic. In this I was never wholly successful inasmuch as while I could do much to alleviate the condition in question I never could be sure just what specific effect my remedies had.

The possibility of rachitic conditions was given some thought in the light of the capillary bleeding complained of by the patients, and although there was a typical blue gum condition in some cases the diet served aboard ship would generally be considered as all that would be necessary to preclude the possibility of anything of this nature.

It being my first experience in the Tropics, and not having observed this condition elsewhere, it seemed reasonable to me to assume that the climate may have had something to do with the matter. Particularly as all patients stated that they had experienced no discomfort until the arrival of their ship in warm waters, and men who had been in the Navy for some years informed me that this condition was not unfamiliar to them, generally clearing up on their return to colder climates and without medication.

This assumption that climatic conditions, if not primarily responsible for these cases, at least were a considerable factor in producing the conditions observed was forced upon me by the insistence of the patients themselves, the uniformity of the cases, and particularly the similarity of the history in each case.

In trying to seek justification for this assumption it occurred to me that it might be possible that climatic conditions might involve a change in the habits of the men aboard ship, particularly in respect to the diet, which fact might be the basic factor involved. I reasoned somewhat as follows:

In the main our men are of the Nordic branch of the white race—men whose natural environment has been for many generations the North Temperate Zone, with its changing seasons. These men are most active when they receive the external thermal stimulant brought

about by seasonal changes of temperature, and without which they become listless and lazy. A change of temperature is a muscular tonus, which brings tonicity to the blood vessels that ought surely to energize the most minute capillary found in the soft tissues of the mouth. On the other hand, in a constantly warm temperature the blood vessels, as well as the muscular structures, become flaccid, due to the lack of external stimuli, which I believe retards their tonicity, and it is possible that a degree of stasis may be established in the microscopical structures, thus lowering that structure's resistance to such an extent that if its environment contains both bacterial or mechanical irritants the structure succumbs to the bacterial invasion and becomes diseased.

Beside the depressing effects of a constantly warm climate upon the body of one who is accustomed to seasonal changes of temperature, we can view the cause and effect of diseased soft tissues of the mouth from the standpoint of an improperly balanced diet. Scientific research has made it clear to us why men like those in Dana's *Two Years Before the Mast* suffered from scurvy. The mouth conditions of men which I have examined were much the same but in milder form. Aside from good meats and plenty of that tuber which is so well known to every American, a sailor wouldn't walk athwartship for anything else except ice cream, cookies, and candy. He doesn't care for "trimmings" or "side dishes." He knows nothing about "fat soluble (A), water soluble (B) and (C)," etc., and it seemed likely that some of my patients suffered from a lack of vitamins, or antiscorbutic foods.

Men on board our vessels are not deprived of green vegetables, even in the Tropics, where they are procured at a great expense, but a great number of these men will not eat "hay." They demand beef and "spuds," and pork and beans; that is their diet. I have seen men go ashore after being aboard for months and order steak and eggs.

It is not that a balanced diet is not provided aboard ship—it is because the men choose from this diet what appeals to their fancy—that it is possible to observe mouth conditions that are typical of an unbalanced ration. A nitrogenous equilibrium is an accident when the men consider only their personal likes and dislikes.

This, I think, accounts for the conditions which I have observed. Presumably other dental officers on tropical duty have observed it also and have been more successful in treating it than I have.

Lieutenant Daniels, while on duty in Pensacola, reports that the first 30 cases to report for dental treatment, each month for 12 months, an average of 9 were cases of gingival disturbance. (H. A. Daniels, lieutenant (DC), United States Navy: "Effect of Carbol

Fuchian Stain on Diseases of the Gingivae." U. S. Naval Medical Bulletin, January, 1923.)

A summary of my observations may be briefly noted as follows:

That tropical service would seem to predispose certain unusual inflammatory conditions of the attaching tissues of the teeth.

That the diet may be a factor in controlling these conditions.

THE MANIPULATION OF MODELING COMPOUND AND SECTIONAL MODELING COMPOUND IMPRESSION TECHNIC.

By J. J. Haas, Lieutenant, Dental Corps, United States Navy.

The manipulation of modeling compound is not difficult when one has a knowledge of its properties or behavior under various circumstances. Compound if not properly heated can not be worked to advantage. It is generally heated by placing it in hot water or in a Bunsen flame. By softening compound in this way one is apt to obtain a compound that is not sufficiently soft to obtain an accurate detailed impression or so warm as to burn the mucous membrane. If compound is placed in a Bunsen flame and heated until its plastic properties are destroyed and it blisters or is scorched, it can not give an accurate impression.

An ideal impression material should have the following characteristics:

1. It should be composed of some material that will not be unduly disagreeable to the patient.
2. It should become plastic at a temperature the oral tissues can tolerate.
3. It should copy accurately the fine lines and irregular surfaces to which it is applied and retain the form so copied, without becoming distorted in removal from the mouth.
4. It should harden in a reasonably short time.
5. It should not expand, contract, or warp at ordinary temperatures to any appreciable degree.
6. One should be able to correct an impression by adding to or taking away from the original mass.

Various impression materials such as plaster of Paris, modeling compound, beeswax, paraffin, beeswax and paraffin combined, and gutta-percha are on the market. Of these, the first two only are of value.

Plaster of Paris has been discarded to a great extent because of its disagreeable taste and because one can not add to a plaster impression (full or partial) for correction. One of the greatest faults or disadvantages of plaster is its tendency to expand. Plaster expands thirty-two ten-thousandths of an inch 32 minutes after setting, and after 24 hours' setting it expands three times that amount. In

taking an impression for a partial case, in which we always have undercuts, the plaster breaks or the operator breaks it in removing the impression from the mouth. Sometimes it breaks clean, but usually it does not. It usually breaks and leaves small pieces at the gum margin and at the edentulous sections, which are needed in producing an accurate cast. If some of the small pieces are crushed, lost, or too small to be replaced, the operator usually tries to reproduce them by building up the deficit with wax, and in no way is he able to reproduce the lost section accurately. Modeling compound is the only material available at the present time which possesses the characteristics desirable in an ideal impression material.

In order to manipulate modeling compound successfully we must first understand its behavior and properties. Modeling compound at ordinary temperatures is a hard, brittle mass. It will break before it bends, and it breaks clean. Modeling compound, when heated to 120° F. in moist heat, will bend, hence the term "the bending stage." Compound at this temperature will not take a detailed impression. When compound is heated to a temperature of 150° F., it is soft and can be molded to take a detailed impression, hence the term "the working stage."

The oral tissues can withstand a temperature of 150° F. comfortably, and compound in this stage can be controlled by the operator. If the temperature is raised above 150° F., the compound becomes sticky, can not be adapted to the oral tissues, as it will scorch them, and it gets beyond the operator's control. Compound is best controlled by using a Supplee heating element, which keeps the upper half of the basin of water at a temperature of 150° F., and the lower half is about 20° cooler. The latter has advantages, because the compound will not adhere to the bottom of the basin at that temperature.

In taking any impression, full or sectional, a tray must be adapted to fit the case. A suitable amount of compound heated to a temperature of 150° F. is secured and seared on the tray. This is done by holding the compound in the Bunsen flame until it sputters and then attaching it to the dry tray. The modeling compound is then formed on the tray to suit the case and the tray and compound is immersed in ice water, tray side down. The compound is submerged half its thickness for 10 seconds. The reason for doing this is that we wish to have a supporting harder mass for the softer molding mass upon which the impression is made.

The mass is then introduced to the desired place in the mouth and the print is taken. The mass is then chilled in ice water, removed, and the water shaken off and the printed surface is glazed with a Tench mouth blowpipe flame. This glazing of compound is neces-

sary for an accurate detailed impression of the part desired. The mass is then tempered. This is accomplished by dropping it into water at a temperature of 150° F. The glazed surface is usually about 170° F. and would scorch the oral tissue if adapted without tempering. When properly tempered it is introduced into the mouth to the desired location and pressed to place. It is then chilled thoroughly with compressed air or syringe full of ice water. The impression is then removed and placed in ice water for final or thorough hardening. The technic described above is called the double introduction method. It is also used in making any correction of full or partial impressions. The foregoing gives the reader a brief idea of the behavior and manipulation of compound, also the advantages of compound over plaster.

In sectional modeling compound impressions one must have the foregoing in mind at all times. The writer will try in a brief way to describe how a sectional compound impression is taken. Let us assume that we wish to take an impression of a full upper set of teeth. The technic to be described will hold good for any case in both upper or lower jaws with all the teeth present or some missing. The first step is a mouth examination, paying particular attention to undercuts. Learn to recognize undercuts and in what direction an impression or section of an impression can be withdrawn without distorting it. In a normal case a sectional modeling compound impression is taken in five sections, two palatal or lingual, two buccal, and one labial. Sometimes the palate can successfully be taken in one section. This condition arises when the teeth diverge occlusally and are not very bell shaped. Also there are cases in which one must take two buccal and two labial sections. This condition arises when the undercuts are so situated as to make it impossible to take it in three outer sections.

The operator adapts a tray to the right half of the palate as previously described. The tray should extend from the median line of the palate to the lingual surface of the teeth and should extend posteriorly to the junction of the hard and soft palate. Sufficient compound is seared on the tray and an impression is taken (double introduction technic) of the right half of the palate including the lingual sides of the right anterior and posterior teeth. The impression is thoroughly chilled and removed and placed in ice water for absolute hardness. Then with a sharp knife (and right here allow the writer to say a word about cutting compound. Always have a sharp knife and always have compound hard before cutting it. If compound is semihard one is apt to distort it by cutting it with a knife; another thing in cutting compound, always cut small pieces at a time; never cut off large pieces, as the knife forms a wedge in the compound in

cutting and will chip off more than is wanted or else it will fracture the impression) the impression is cut at the median palatal angle at a 45° bevel and also cut at a 45° angle at the lingo-occluso and lingo-incisal angles inward; that is, toward the tongue. Then the impression is tested by placing it in its place in the mouth and observing if it is adapted to the required surfaces, and corrections made if necessary.

Cocoa butter is smeared on the surface which is to face the opposite section. Cocoa butter is used as a separating medium to prevent the sections from adhering to each other.

A tray is adapted for the left palatal side and, with sufficient compound seared to it, is inserted into the mouth in which the right section is already in place. The impression is made, the mass cooled with a syringe full of ice water, removed, and placed in ice water for final hardening.

The second section has been adapted to the first section at the median line, hence no trimming is necessary there, but the lingo-occlusal and lingo-incisal angles should be trimmed at an angle of 45° inward as the right section was trimmed. The two sections are now placed in the mouth and inspected as to their accuracy. If not accurate, corrections should be made before proceeding any further. It will be noted that when the left section is in its proper position it holds the right section in place, due to the 45° bevel made on the right section at the median line.

A tray is now adapted for the buccal section. This section usually includes the molars, bicuspid, and half of the cuspid. The writer has observed from experience that it is easier to have the section stop halfway on a tooth than at the approximate space, as the labial or adjoining section is easier adapted on the labial surface of a tooth than in an approximate space. This section also includes the occlusal surface of the teeth. The tray is usually bent at an angle of 90° to support the compound that is to take the occlusal surfaces. Compound in a sufficient quantity is adapted to the tray, and with the palatal sections in place, with the approximate surfaces of the sections smeared with cocoa butter, the buccal section is pressed to place, chilled with ice water, removed and chilled to absolute hardness in ice water. The anterior side of the buccal section is beveled at a 45° bevel distally and should include just half of the cuspid. The other buccal section is made just as described. Then all four sections are replaced into the mouth and the remaining or labial section is adapted.

After all sections have been made it is assembled and inspected for imperfections in the joints. The impression is now assembled and luted together with a hot spatula, boxed and poured with Spence

plaster. It is a good policy always to box and pour the impression as soon as it is made, for if the impression is permitted to lay around, say overnight, the temperature in the room is usually increased to such a point as to bend the compound out of shape. The cast obtained from the above technic is as near accurate as it is possible to obtain with the impression materials available to-day.

THE WIRING METHOD OF TREATMENT FOR FRACTURES OF THE MANDIBLE.

By E. H. Tennent, Lieutenant Commander, Dental Corps, United States Navy.

This article is not offered as one explaining a new method for treating simple or compound fractures of the mandible or as an elaboration on one, but is written more as a detailed review of a method which is being used and is indicated in most cases. The method is only applicable to those cases with teeth and to those cases having a reasonable bite. In the naval service, fortunately, we have the first condition and usually the second. We are all familiar with the scheme, yet, without opportunity to practice it, one is liable to forget the finer points.

At Hampton Roads during the period between December, 1917, and March, 1920, many cases of fracture of the lower jaw were treated; not merely fractures of the alveolar plate, but complete dissolution of the continuity of the body and ramus. Some were simple fractures, but most of them were compound and multiple. At the League Island hospital in the past 10 months 10 fractured jaws have been treated, all compound and multiple. In practically all of the cases the wiring method was used. When there are enough teeth present, other than those that may be in the line of fracture, wiring is the best method to employ.

The preliminary treatment of any compound fracture consists in clearing the wound of foreign particles and approximating the parts. If the wound is painful, nitrous oxide gas and oxygen may be used. Apply a snug Barton bandage, have an X-ray examination made, and then put the patient to bed, with an ice bag applied to the injured part while waiting for the X-ray plates to be developed and other preparations to be made.

A study of the X-ray plate will reveal the angle of fracture, any fractured or impacted teeth present, and will assist in determining the advisability of keeping a tooth that may be in the fracture area. In a case involving a third molar, that tooth should invariably be removed, for it is a very difficult tooth to get out should conditions demand it after the jaws have been splinted. In the case of a third molar that has not yet perforated the mucous membrane, when the fracture involving that tooth is not compound and the tooth does

not tend to hold the approximating ends apart there remains a question as to whether or not it should be removed. One's judgment is really put to a test here. The writer has in mind, of course, third molars that are simply unerupted, not impacted molars that surely would give trouble under ordinary conditions.

In preparing for the operative treatment at least 32 brass ligature wires, 24-gauge, should be well annealed; short-jawed scissors, pliers, conductive syringe, needles, and procaine should be made ready. If teeth are to be removed, forceps, elevators, and surgical burs must be at hand.

Upon putting the patient in the chair clean the mouth thoroughly, remove any tartar, and temporarily fill any cavities. Look for any putrescent pulps that are liable to give trouble while the jaws are splinted. It is best to open a tooth containing a putrescent pulp, remove the first third of the diseased tissue, and seal in tricresol and formalin. Should this tooth give trouble after the splints are on, a small hole at an acute angle to canal can be made easily with a spear pointed drill directly into the pulp canal and the usual treatment carried on. These preliminary but very important functions attended to, make the necessary conductive anesthesia injections. If a putrescent pulp or tooth is to be removed, it should be done after anesthesia is thus obtained.

The conductive injections are to be made at the nearest foramen on both sides of the field of operation. For a mandibular injection use 2 c. c. of a 2 per cent solution, and for a mental injection usually one-half of 1 c. c. will suffice, except where the field of desired anesthesia is between the two mental foramina; then 1 c. c. of the anesthetic solution must be injected on each side, making sure to force it into the canals with the finger at the time of the injection. The usual 20-minutes wait is required for the mandibular and about 10 minutes for the mental anesthesia.

As soon as anesthesia is obtained it is well to determine the relationship of the teeth of the lower jaw to those of the upper. Every mouth, no matter how irregular the teeth may be, has a definite bite, one that is comfortable to the patient and is easily recognized by him once the teeth are put in their accustomed occlusion. In the nearly normal bite the patient's feeling is your guide, while in one of very irregular teeth the abrasions on the cusps and dental planes should help you.

The bite being determined, the next step is to decide on the line of stress—that is, which of the teeth present must be secured together to receive the "pull" necessary in opposition to the natural tonicity of the muscles finding insertion in the lower jaw.

The experienced operator does not take long to accomplish all of the above and is soon ready to start wiring. The softened wires are

bent on themselves in the middle and dental tape is threaded through the loop thus formed. (Fig. 1.) Carry the tape through the contact points of the teeth and draw the wire inward through the interdental space, then repeat with the tape on the opposite side of the tooth, but drawing the wire outward this time to form a loop about the neck of the tooth, with the free ends of the wire next to the cheek. (Fig. 2.) Draw the wire up tight and twist with the fingers enough to keep it from slipping, and then with flat-nose pliers twist the wire ligature up snug about the neck of the tooth, using care not to catch any of the gum under the wire, and yet be sure that it is up above the gingival ridge. The operation is repeated for each tooth which is to carry a ligature. All twists of the wire must be to the right, and at this stage all ends must be left long. If care is used, very little pain will be experienced on the upper jaw. Now, with all wires in place, instruct the patient to relax his muscles completely so that the lower jaw may be brought as near as possible to its correct position. While the muscles are relaxed it is easy to bring the teeth into their former relation to each other. Once in position, remind the patient to keep relaxed and have him bring his hands up to the jaw so that each side of the body will rest in the palm (fig. 3), and at the same time make gentle pressure upward and hold the position until told to relinquish it. Now ask the patient if his teeth feel comfortable and if they are in their natural position. He can quickly tell you. It is important that the head must be on or a little forward of the axis of the rest of the body, otherwise the muscular strain will distort the parts.

Being satisfied that all is well, twist the free ends of the opposing wires with the fingers, leaving the long ends at right angles to the line of stress. Do this to all wires, twisting to the right. Once more make sure that the correct wires are coupled together and that all teeth are in occlusion. Being satisfied, draw up with flat-nose pliers until the patient feels a good pull on the teeth, which he will never fail to indicate. Next cut the protruding wires off about one-half an inch from the beginning of the twist, and then with pointed-nose pliers bend the projecting ends in, making the wire bend at about the middle of its length, so as not to disturb the stress. (Fig. 4.)

Some operators cover these wires with varnished cotton or gutta-percha, but that is not necessary, for with little care in bending the wires there is not any danger of irritating the mucous membrane of the cheek or lips and it is far more sanitary to leave the ends uncovered.

The case should be watched each day, spraying all parts that can be reached with the dento-spray, using a solution that will not corrode the wires. All wires must be kept taut, for one loose wire will

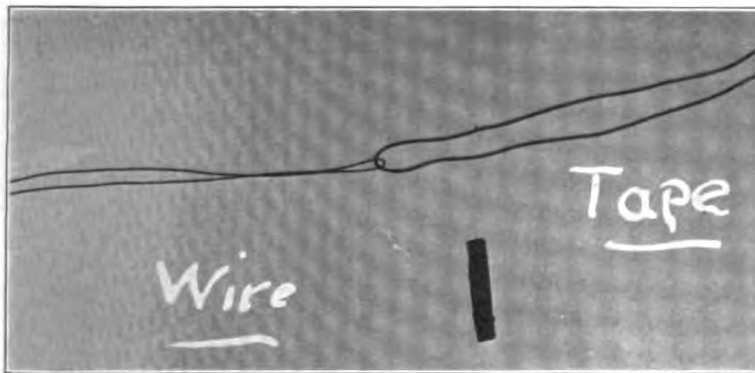


Fig. 1.—DENTAL TAPE THREADED THROUGH WIRE LOOP.



Fig. 2.—WIRE LOOP ARRANGED ABOUT NECK OF TOOTH.



Fig. 3.—PATIENT SUPPORTING FRACTURED JAW WITH HANDS.

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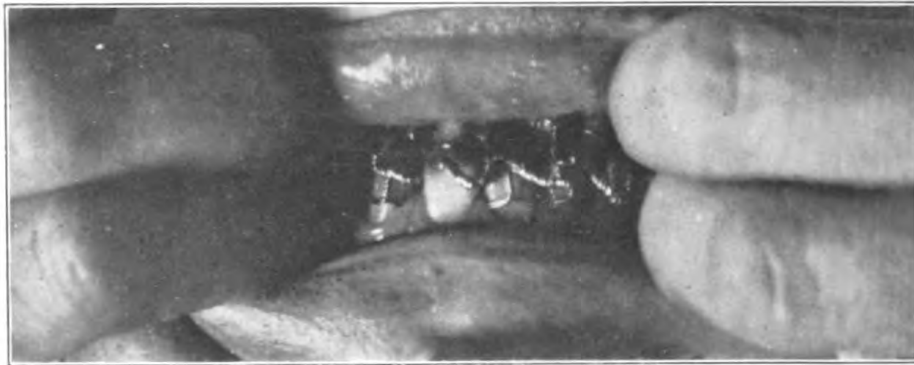


Fig. 4.—WIRING COMPLETED.



Fig. 5.—REMOVING BROKEN WIRING.



Fig. 6.—REPLACING BROKEN WIRING.

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spoil the results, besides making the gum sore about the neck of that particular tooth.

Wires will break, no matter how much care you may give the case, and these must be replaced by new ones. Experience has taught that when one wire breaks, both ligatures must be renewed, for when twisting the unbroken one for the second time it will surely break.

The technic of replacing broken ligatures is as follows: With the pliers straighten and untwist the bent ends and separate them. Cut the doubled wire about the neck of the tooth, place the middle of a 10-inch piece of dental tape between the short ends of the wire and then twist the ends together forming an eye. (Fig. 5.) Seize the other end of the wire with the pliers and, using counter pressure, pull the wire from around the tooth, making the tape take its place. This in turn becomes the means by which the new ligature is carried to place; that is, by reversing the process. (Fig. 6.)

Throughout the period of treatment keep a snug Barton bandage on the head. A word of caution about fastening the safety pins at the side of the jaw is in order. After putting the pin in position seize the pin part with a hemostat and hold it rigid until the pin is fastened. When the lower jaw is in two or three pieces, a portion may be easily displaced by accidental pressure while pinning with safety pins.

Infection frequently appears after the fracture is in splints. When pus is present, simply incise the gum from below upward from the junction of the cheek or lip with the gum. With periosteal elevators rip away the soft tissue from the bone for a distance of about three-eighths of an inch on either side of the line of fracture and retract. Where pus has been present for 15 or 20 hours, the outer plate of the bone covering that area will be very thin and can easily be broken down with the chisel and mallet, but the bone must be supported by an assistant while using these instruments. Of course a fissure bur may be used. It pays well to make a good exposure of the infected area and thoroughly curette, making sure that there are no small particles of detached bone left. Place one or two sutures, as the case may demand, leaving enough opening to dress from above. With a pipette flood the area with dichloramine T solution and insert a small sterile gauze wick, carrying it to the bottom of the wound. From this time on the healing will proceed slowly, and the case must be dressed each day until the wound is filled in from the bottom. Of course, the dichloramine T solution is a matter of choice.

Diet must of necessity be liquid or thin enough to be drawn through the teeth. Never extract a tooth for the purpose of feeding.

Such items as the following are useful: Soups—turtle, tomato, pea, chicken, oyster, and vegetable. The semiliquid substance of creamed celery, potatoes, cauliflower, and onion can readily be drawn through or around the teeth. Coddled eggs; eggnog; soft custards; gelatin; chicken jelly; milk; tea; cocoa and coffee with plenty of cream; and fruit juices of all kinds.

There is one point that must be considered regarding fractures posterior to the last molar tooth, and this is to be considered whether the wiring method is used or not. It is the question of whether the two opposing ends of bone should be wired together, opening from the outside for the purpose. Just now I have under observation a case which was fractured and wired about six months ago, and recent X-ray examinations show unmistakable disintegration of bone tissue where the wire passes through, and I believe that it is only a question of time before this wire will have to be removed. The only time such a wire is indicated is when there are two lines of fracture, one at the angle and the other at the neck of the condyle. In the case of a single line of fracture the joint action of the two pterygoides on the inside and the joint action of the two parts of the masseter muscle on the outside of the ramus supported by the heavy or thick gum tissue are quite sufficient to keep the bones lined up.

Just a word about the number of teeth to be wired. It is noticed that Marshall and Blair seem to be content with wiring only four sets of opposing teeth—that is, two upper to two lower on each side—and many dental officers with whom I have discussed the subject think that sufficient. Experience has taught me that the greater the number of teeth wired the more certain is success.

The writer has been questioned several times lately as to whether he did not think a Barton bandage sufficient. Most emphatically no. Of course the bone may unite, but faulty occlusion is sure to result. For obvious reasons, it is best to restrict the liberty of fracture cases until all splints have been removed.

THE USE OF THE MODIFIED BAKER ANCHORAGE IN THE NAVAL DENTAL SERVICE.

By W. L. Darnall, Lieutenant Commander, Dental Corps, United States Navy.

The principles involved in the treatment of mandibular fractures are the same as those applied to fractures of all bones, namely, that there be a proper reduction of the fragments, their retention in apposition, and proper care of the tissues of the mouth. Maintenance of mouth hygiene is a very important factor and becomes more of a necessity because of the possibility of infection from the oral cavity.

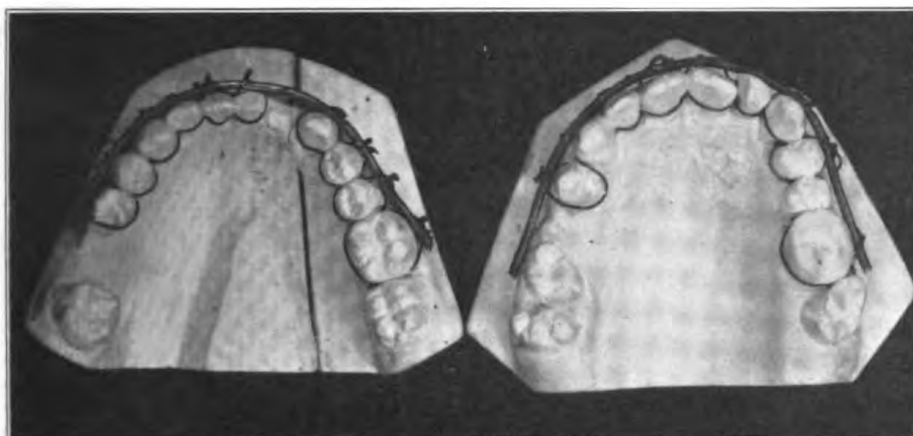


Fig. 1.—ARCHES WIRED TO TEETH.



Fig. 2.—INTERMAXILLARY RETENTION, USING ELASTICS.

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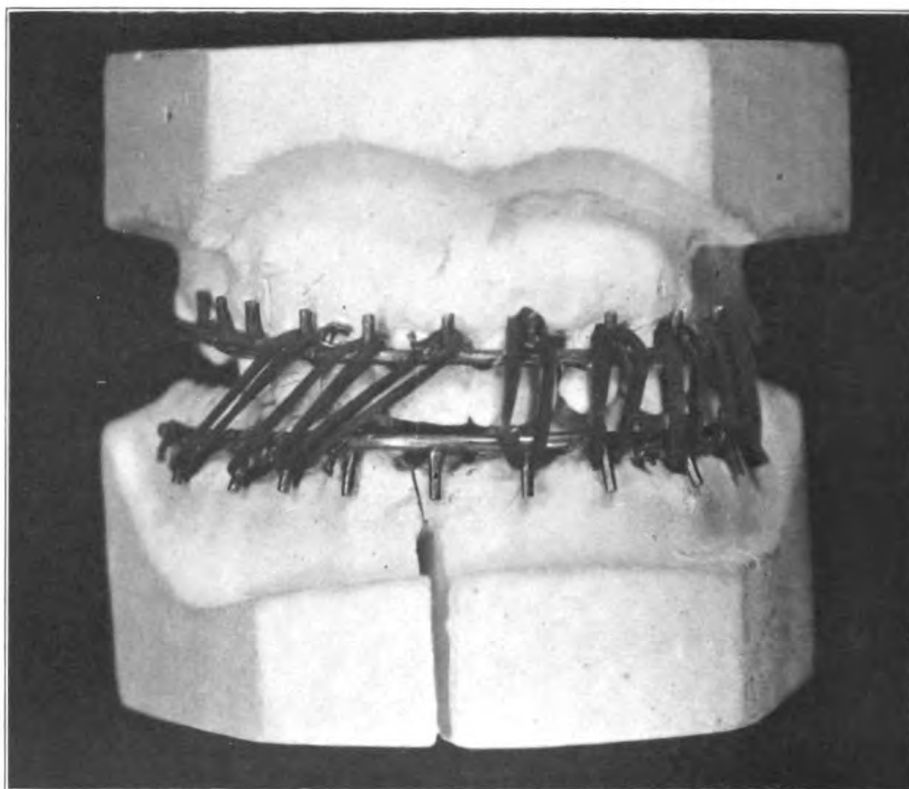


Fig. 3.—SHOWING STRESS APPLIED TO LATERAL FRAGMENTS.



Fig. 4.—SHOWING PATIENT FORCING JAWS OPEN, WITH ELASTICS IN PLACE.

According to Kazanjian, appliances for the treatment of maxillary fractures fall into two distinct classes: (1) Those which are designed for the immediate fixation of the fragments, and (2) those appliances and splints so constructed as to cause a slow reduction of the fragments.

The methods at hand for the immediate use in the naval service are intermaxillary wiring and the modified Baker anchorage.

Intermaxillary wiring is properly classified under the head of immediate fixation of the fragments and under certain conditions this is preferable to other forms of retention.

In enumerating the advantages of intermaxillary wiring, Eby emphasizes the following points, which make this method particularly valuable where immediate fixation of the fragments is desired.

(1) When sufficient teeth remain in the arch all parts are immediately brought into their proper relation by direct fixation, thereby establishing a condition of physiological rest.

(2) This method requires very few instruments and little material.

(3) Much time ordinarily consumed in the making of splints is saved.

(4) Its accomplishment under all existing conditions with comparative ease to both patient and operator.

Of the disadvantages which may be mentioned, the greatest from the standpoint of the naval dental surgeon is the liability of strangulation from nausea when transporting cases at sea. In connection with this possibility, Eby cites lessons learned in the late war, and makes reference to a statement that was current in America to the effect that the British, during the early days of the war, lost many cases due to strangulation brought on by seasickness. That this factor is a vital one was evidenced by the promulgation of an order in the American Expeditionary Forces, prohibiting the embarkation of casualties for home with the intermaxillary form of wiring in place. These cases, on arriving at the point of embarkation, had these wires cut, allowing the jaws to remain open until treatment could be resumed. Other apparent disadvantages are the inability to properly feed the patients so wired and the possibility of not being able to maintain mouth hygiene.

Blair states that in treating fractures of the jaws it is of not so much importance to be acquainted with the large assortment of various forms of apparatus that have been devised as it is to understand the muscular action that caused displacement.

That the principles of orthodontia enter into the treatment of fractures is best brought out by Eby, who says: "In orthodontia tooth movement and retention is the object to be effected by means of anchorage of certain mechanical apparatus upon the teeth. In

maxio-facial surgery the movement is of bone fragments en masse, and their retention is the object by the attachment of mechanical apparatus to the teeth. The problems of anchorage are similar in many respects, but vary with condition of environments, etc."

The modified Baker anchorage which has recently been added to the supply table places in the hands of the dental surgeon an appliance which can be used either for immediate fixation or for slow reduction.

This method consists of securing a metal bar, to which lugs are soldered at intervals, to the labial and buccal surfaces of the upper and lower teeth by means of small wires passed around the teeth and twisted to the bar. (Fig. 1.)

If direct fixation is desired the arches can be wired together, thus adopting the Gilmer principle, or elastics may be supplied as in Figure 2.

In the gradual reduction of fractures, consolidation of the displaced fragments has usually progressed to a greater or less extent. In those cases of lateral displacement of the fragments, this appliance is particularly suited, intermaxillary traction being applied by using elastics, thus combating any tendency toward a deviation of the principal fragment. (Fig. 2.)

Stress is applied according to the location of the fracture, care being taken to carry out fundamental orthodontic principles.

In those cases to be transported by water a sufficient number of elastics should be used to keep the jaws in normal occlusion, and yet permit of forcing the jaws apart by grasping the chin and pulling it down. (Figs. 3 and 4.)

There will be those who question the advisability of this form of appliance at sea, but as a favorable prognosis depends upon early reduction of the fragments, the application of this form at sea will permit of early treatment in certain cases which would otherwise have to be postponed.

The advantages of this type of appliance may be summarized briefly as follows:

The intermaxillary elastics or wires, whichever method of fixation has been elected, may be removed and the mouth cleansed without disturbing the arches themselves. That this is an important phase in the treatment of all fractures of the mandible is stressed by Speed, who says: "Many failures of union of the inferior maxillary may frequently be traced to the lack of proper oral sepsis. It is of great importance that this phase of treatment be not overlooked in the selection of a suitable appliance."

The possibility of breaking the wires used in ordinary intermaxillary wiring is eliminated also by the use of the Baker modification.

While this form of appliance may not meet the requirements in all cases, it will take care of a vast majority, especially in peace time, where the cause has been traumatism, without destruction of bone tissue. It gives to the service a method of combating the factor of strangulation in transporting fracture cases at sea.

CEMENTATION.

By H. E. Harvey, Lieutenant Commander, Dental Corps, United States Navy.

The manufacture of dental cements is shrouded in mystery; that is, the exact details of their preparation and composition. This is due to business acumen and coincides with the advice of Thomas Edison, whose faith lies not in patents but in the perfection of processes to obtain the desired results, the assistance of skilled workmen, and secrecy. Secret formulæ, however, are open to the general objection that more may be claimed for them than is substantiated. Tests by unbiased parties are valuable. All are familiar with the claims of manufacturers as to the merits of their particular products.

We are informed that the cements in common use have a basis of zinc oxide and phosphoric acid. A mixture of these two substances sets almost as soon as they are brought together, with the evolution of considerable heat. Therefore modifiers are necessary to produce the articles of commerce which set slowly, with properties varying as to the uses to which they are intended. The composition of these modifiers as well as the special treatment of the zinc oxide and the acid constitute the trade secrets. With a knowledge of the constituents and their treatment we might not be any better off from the standpoint of practical users; however, such knowledge would provide a means of comparing in an intelligent manner claims set forth for this or that special product.

The mixing of cements for dental operations is usually delegated to an assistant who, after very meager instructions and with little or no thought or knowledge of the chemical reaction involved, sets forth often armed with a flexible steel spatula and an insignificant slab at room temperature.

Buildings are only as strong as their foundations, and this applies to cementation, particularly in these days of inlay and three-quarter crown attachments. Failure of inlays at the gingiva is of frequent occurrence, and in the opinion of some this is due, to a large extent, to carelessness in the procedure of cementation. To overcome this it is recommended that the cavity be thoroughly coated with the cement and that the inlay also be carefully covered with cement, with especial reference to the gingival portion. This point is well taken, but perhaps improper mixing of the cement is to be held responsible

in more instances for the failure. Sufficient working time between the completion of the mix and the time of setting is essential if undue haste is to be avoided in performing a cementation. Some individuals attempt to obtain more time by making a thin mix, one which will flow freely from the spatula. This is improper and has two dangers. The first is that an excess of liquid is probably present, resulting in a compound which is not dense and more or less weakened by a honeycomb structure as the surplus acid dissolves out. This, then, presents a favorable condition for the absorption of food-laden saliva, the putrescence of which accounts for the odor so often noticed upon the removal of gold crowns. The second is that improper incorporation of the powder and liquid has probably occurred, as haste being thought essential, the mixture is made and used too quickly.

In the mixing of cement we are dealing with a chemical reaction, and with this in mind it is necessary to bring into play certain principles which, according to our knowledge, will assist in the reaction.

Outside of the personal equation four items enter into consideration—the slab, the spatula, the liquid, and the powder. The properties of each should have our attention. The slab should be of sufficient size to be grasped easily and firmly, and with a large surface for facilitating thorough spatulation. It should also have bulk, which will assist in absorbing a portion of the heat generated by the reaction. To this end the slab one-quarter of an inch in thickness would seem of little value. One an inch in thickness with other dimensions in proportion is suitable. A warm slab makes haste for the reaction, and this must be avoided. Room temperature in a well-heated office approximates summer temperature so closely that the slab should be cooled each time before use. Avoid extremes; to keep the slab in an ice box or in ice water would result in condensation of water from the atmosphere, and this, if incorporated in the mix, would seriously affect the balance of the reaction. By placing the slab under a trickle of water at the faucet, the temperature of the water and the resultant evaporation will reduce its temperature sufficiently.

The spatula should be one which is not flexible and which has a good broad surface with an evenly bellied blade. The purpose should be to get an even thorough mixture of the powder and liquid with firm spatulation. A thin flexible spatula if pressed to conform to the surface of the slab presents such a thin edge to the mixture that most of it goes over the upper surface of the blade as it moved back and forth. Spatulas of stellite are the only ones which seem to fulfill the requirements, and in using these the blade must necessarily be held so that its full length comes into contact with the surface

of the slab. Thus as firm pressure is exerted as the spatula is moved back and forth the mass will be thrown under the bellied surface of the blade rather than escaping over it without pressure. This makes for an intimate mixing of the liquid and powder.

Being a chemical reaction, the mixing of cement generates an appreciable amount of heat. This may be strikingly illustrated with certain of the commercial products, which will produce as much as 180° F. when mixed with undue haste. When it is recalled that water at 140° F. is too hot in which to hold the fingers, it will be appreciated what 180° means; and this for a material possibly to be inserted in a cavity sensitive to the slightest temperature change. To avoid a degree of heat closely approaching 140° F. several precautions can be taken, one of which was mentioned—cooling the slab. When making the mix a large portion of the surface of the slab should be covered with the mass, thus utilizing the cool surface of the slab to absorb some of the heat. This also exposes a large surface of the mix to the cooling effect of the air. One of the greatest factors, however, is that the mix should be slowly made; this besides giving time for the reaction to take place, gradually likewise gives opportunity for the dissipation of heat. The powder should be placed well over to one side out of the way. The first incorporation of the powder into the liquid is the critical point; just enough powder should be used to color the liquid, which is then given thorough spatulation over a large surface. This first mix is the initial chemical reaction and here much of the heat can be dissipated. If this is done a cooler mix is produced and one which sets very much more slowly and denser than a hot mix. After this has been accomplished the powder may be added in portions well spatulated after each addition and spread over the same surface. As the mixture is being made with pressure, streaks of the slab may be seen through it; a clear streak following the spatula is an indication that it is being properly made, granulations or unevenness to the contrary. Thus an opportunity is constantly present to check a tendency to haste.

Powder is added until a consistency is obtained which when elevated on the spatula will leave it in a slowly forming drop, and as it strikes the slab will maintain its globular form an instant and then slowly settle. If a slow initial mix has been made under the conditions set forth, plenty of working time will yet remain in which to perform any cementation. It is common practice to get a mix of a certain consistency and to spatulate this until it thickens. This is not correct, as one is waiting for the initial setting to take place on the slab and consequently appreciably shortens the working time. The proper procedure is to continue to incorporate additional powder until the required consistency is obtained. An inlay set with

such a mix can be forced easily to place and will not raise from its seat. In the past considerable difficulty has been experienced by some in that after an inlay was seated it was necessary to apply sustained pressure in order to prevent outward displacement as the cement set. This is said to be due to expansion of cement due to the formation of gases generated by the heat induced by too rapid a mixing. The density of the finished product apparently bears a ratio to the amount of gas generated and this to its consequent porosity.

Beside helping to overcome an excess temperature change a mix correctly made has other advantages, and not the least valuable of these is the great addition to the length of working time before it sets. Made as set forth the mixture remains in the plastic stage a very considerable time.

Experiments, particularly those of Dr. Joseph Head, of Philadelphia, have shown that cement after setting exhibits no adhesive properties, but that it depends for retention on accurate adaptation and undercuts. As is the case in the manipulation of amalgam, cement should be plastic when inserted in order that advantage of this property may be taken to secure uniform and accurate adaptation.

Often it is desirable to use a cement lining or base as preparatory for some other filling material. In making a mix for this purpose only a slight change is made, and this is not in making the mix thinner but in making it thicker. An endeavor to line a cavity with a thin mixture of cement presents its own difficulties, not the least of them being a tendency to get it every place but where needed; usually it exhibits a particular affinity for the margins, where it can do the most harm. The mix is made as outlined, except that instead of stopping at the point indicated additional powder is added until the mix shows a slight tendency to crawl after the spatula.. The face of a small serrated plugger is inserted in the mass, and as it leaves a quantity of the cement will adhere to it, with one or more finger-like projections of cement. It is transferred to the cavity, being stiff enough to go in feet first, the plugger is detached and a smooth, plastic instrument is used to adapt it to the cavity. If this is done with a mix which has been stiffened by adding powder and not by allowing it to partially set, it will be found very expedient and there will be plenty of time for adaptation.

Cements properly mixed are to a large degree insoluble in the saliva of some mouths, but they are not very resistant to attrition.

To summarize:

Use a large slab.

Use a cool slab.

Use a stiff-bellied spatula.

Incorporate a very small portion of the powder at first.

Grind the powder and liquid together with forceful spatulation.

Cover a large area of the slab.

Stiffen to the desired consistency by the addition of powder and not by spatulating a thin mix until it has partially set.

CLEAN COTTON PELLETS.

By H. E. Harvey, Lieutenant Commander, Dental Corps, United States Navy.

Cotton pellets for dental use have been recently added to the supply table, but a holder or dispenser for these pellets was not adopted due to the fact that one could not be found which would answer the requirements of surgical cleanliness.

Observation leads one to believe that these pellets as they are commonly used are a source of danger inasmuch as they seem to present a means by which the holder or remaining pellets may be contaminated and thus make possible the carrying of infectious material from one patient to another. The cotton pliers which are used for handling pellets come into contact with the secretions of the mouth or are otherwise contaminated; the pliers being then used to pick up another pellet gives reason to infer that the holder or some of the remaining pellets will be touched and thus open an avenue of cross infection. The manufacturers offering no solution to the problem, it occurred to the writer that some device might prove acceptable which would permit of its being sterilized after each patient. To this end the following suggestion is offered.

Use a piece of ordinary galvanized iron-mesh wire, such as is for sale at all hardware stores, the mesh to be five-sixteenth-inch squares, soldered at the intersections. This wire mesh is obtainable in the Navy on the medical supply table as the wire splinting material, designated as "Splint, wire mesh for." A circular piece 3 inches in diameter is cut, and the sharp edges smoothed with sandpaper disks. The center is pushed in from one side to make a dent sufficiently deep to cause the center of it to stand away from a flat surface one-fourth of an inch when placed upon it concave side down. The circumferential edge should rest evenly on the surface. This may be nickel plated if desired, or may be made of some other suitable material, and represents the finished product.

The pellets, to prevent contamination, should remain in the original container until used, and only those to be used at a single operation should be removed at one time. A flap $1\frac{1}{4}$ inches square is cut in the side of the original pasteboard box container and bent outward; this opening permits of a small quantity of pellets being

removed with pliers and the flap to be pushed back to prevent the ingress of dust, etc. The routine established is to place a clean paper cover on the bracket table for each patient, and on this in the proper position a bunch of pellets which have been removed through the window in the container with a pair of surgically clean pliers. Over these is placed the wire mesh concave side down, settling it slightly so that it rests evenly on the table. As the pellets are used they are picked up one by one through the spaces of the mesh, which prevent more than one from being lifted at a time. At the conclusion of the appointment the mesh is lifted away from any remaining pellets and is sterilized by boiling with the other instruments in preparation for the next patient. The remaining pellets are placed in a reservoir for resterilization in the autoclave. A fresh lot from the original container is used for each patient.

While the above does not answer the requirements for a strictly aseptic technic on account of the placing of the pellets on the paper and the use of them from the original container, it does overcome the possibility of carrying infection from one patient to another, and this seems sufficient for the usual dental operations. A sterile operation, such as is indicated for root canal work, would require a slight modification in that the pellets should be previously autoclaved and laid on sterile gauze before the wire netting is placed over them, or, in lieu of this, the routine outlined above may be followed and each pellet sterilized in the molten metal sterilizer immediately before use.

Correspondence with one of the manufacturers of pellets elicited the fact that they are placing on the market a holder or dispenser devised to hold several sizes of pellets, to be used by extracting with the cotton pliers a pellet of the desired size just previous to use. The use of this holder, however, can not be advocated, as it presents the very faults which we are trying to overcome. To visualize what may occur in any given instance, the following experiment was made: The holder was placed on the bracket table, and the cotton pliers used in the experiment instead of being moistened with saliva, were moistened with ink, and then used to remove the pellets from the holder. The results were what might be expected; the container showed ink stains about the orifices through which the pellets were extracted and caused discoloration of pellets subsequently removed through the same orifice. The casing of the holder is celluloid, and the complete apparatus is one not lending itself to any convenient method of sterilization. This represents the highest achievement of the manufacturers. The moral is self-evident.

FIELD SERVICE INSTRUCTION FOR DENTAL OFFICERS OF THE NAVY.

By J. V. McAlpin, Lieutenant Commander, Dental Corps, United States Navy.

The Army Medical Field Service School provides a course of instruction of value to the naval dental officer in so far as it supplements his strictly technical education in professional subjects by a training designed to increase his scope of usefulness when assigned to duty with marines.

The problems which may confront the Medical Department of the Navy on shore duty with an expeditionary force are naturally not those which apply aboard ship, and it has been recognized that special training of officers is necessary in order that it may function efficiently.

The duties of the dental officer stationed with marines, at permanent training stations, yards, and barracks is practically the same as when on duty at navy yards and naval stations within the continental limits of the United States, with the country at peace.

In time of war, however, or ashore, with an expeditionary force, the purely technical side of a dental officer's duties must of a necessity be subordinated to duties of a more military nature.

It is with these duties that the course now being given at Carlisle is chiefly concerned, and the instruction furnished is designed to coordinate the Medical Department's activities along well-organized lines in an effort to develop the service furnished to accord with the most efficient and well-conceived methods in the technic of war.

As an officer of the Medical Department the dental officer functions as a specially qualified assistant to the medical officer and as such is expected to be well acquainted with many duties ordinarily performed by the medical officer himself, as he may be called upon to function in any position in which the commanding officer may see fit to place him.

The well-trained dental officer should have a general knowledge of maps and map reading. He may well know something too of map sketching. The occasion may arise when he may be directed to proceed to a certain spot by means of a map. He should know, therefore, how to arrive at this destination, in the shortest possible space of time and over the best route. This is often important in so far as his field equipment must be transported also.

When on duty in the field and in the absence of a medical officer a commanding officer has every right to expect that, should he call on the dental officer for advice as to sanitary provisions, the dental officer will be qualified to give him proper advice regarding correct sanitation of the camp. With this in view, much time is spent at the Army Medical Field Service School in modern methods of

camp sanitation. Dental officers are given the same instruction in this subject as medical officers. A knowledge of the methods of supervision of troops on the march and at temporary halts is given the dental officer as being of value when there is no opportunity for him to function in his strictly professional capacity. He is informed, however, that his is a purely advisory position, and that in the final analysis the responsibility rests with the commanding officer.

It must be borne constantly in mind that while the primary function of the dental officer is to prevent, relieve, and correct dental disease, he has a broader duty in the military service and it is with this duty that the majority of professional men on admission to the service are totally unacquainted.

In this connection it is pointed out that during the late war many dental officers were placed on duty at aid stations during action when their knowledge of the requirements of the situation undoubtedly was the means of saving many lives. This duty being performed not as dentists but as dental officers and officers of the Medical Department, and that adaptability and aptitude for the service should be outstanding characteristics of all who are members of the Dental Corps.

The dental practitioner, perhaps more than any other professional man, is inclined to get into a rut, and from the very nature of his operating his viewpoint may become narrow. In the service he must, if he would be successful, be ready when called upon to advise and aid with all the knowledge at his command both the medical officer and the commanding officer. He should be able to formulate practical sanitary measures whenever required by the commanding officer, and, if necessary, supervise the carrying out of such orders as may affect the health of the command. With this knowledge he must have the capacity for hearty cooperation at all times.

Dental officers at the Carlisle school are given instruction in first aid, transportation of the wounded from the field, a knowledge of the routine activities in evacuation of advanced bases, the classification of casualties, and the routine treatment that has been determined to be advisable in each case according to its classification. The standard Army litter drill and the application of the Thomas splint is also a part of the course.

As a means of augmenting the technical knowledge of the dental officers of both arms of the service to render them more capable of fulfilling their destiny as efficient units of the vast fighting machine, the course given at Carlisle would seem well suited to the needs of the Dental Corps of the Navy.

CASE REPORT.

By L. C. Frost, Lieutenant, Dental Corps, United States Navy.

Ackerman, James A., apprentice seaman; age 20; white; admitted, April 1, 1922, to United States Naval Hospital, Canacao, P. I., from U. S. S. *Beaver* with diagnosis conjunctivitis acute left eye, for which he had been treated 10 days prior to being admitted to hospital. After admission to hospital, treatment for conjunctivitis was continued until April 6, when diagnosis was changed to iritis. Left eye showed typical symptoms of low-grade iritis; circumcorneal injection, no secretion, photophobia, muddy color of iris, sluggish pupil, and partial blindness. Pain in temple, no hypopyon, iris dilated evenly under atropine, no synnechiæ.

Tonsils were hypertrophied and crypts filled with débris. They were removed under local anesthesia. This resulted in no improvement to the eye. Examination of nose and accessory sinuses was negative.

Patient was being treated for gonococcus infection of the urethra at this same time, though this condition was almost cured at the time of his admission to the hospital, so it was discounted as the causative agent, as the iritis did not improve with the improvement of the gonorrhea.

Examination of the mouth showed several carious teeth in the upper jaw, one small cavity in the upper right first molar, a large cavity involving almost the entire occlusal surface of the upper left first molar, and two small cavities in the upper left second molar. These were filled. An X ray of the teeth showed a slightly impacted and unerupted upper left third molar, and it also showed a rarefied area along the sides of the roots of the upper left first molar, though it did not extend to the apex, and the tooth was vital. It was extracted, though its removal did not improve the condition of the eye. The X ray of the anterior teeth showed a fully developed impacted upper left canine (see picture). This was extracted under local anesthesia after removing part of the labial plate of the alveolar process. Three sutures were used to close the incision in the gum.

The third morning after the removal of the impacted canine patient stated that he felt very much improved as to pain in eye and temple. Circumcorneal injection was very much lessened, and iris has almost resumed its normal luster. Ophthalmoscope examination showed slightly turbid media. The patient could distinguish hand at 5 feet.

Nothing was done to the slightly impacted third left upper molar, as it was thought that it would erupt without difficulty on account of the second molar drifting into the space formerly occupied by the first.

The treatment for the iritis was administered concurrently, but it is thought that the extremely prompt improvement of the iritis was plainly due to the extraction of the impacted canine.

Patient discharged to duty May 5, 1922.

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EDITORIAL.

THE DENTAL DIVISION OF THE BUREAU OF MEDICINE AND SURGERY.

In accordance with the plan of the Surgeon General, announced some time ago, the dental division of the Bureau of Medicine and Surgery was recently made official by its incorporation in the organization chart prepared for the Secretary of the Navy.

As the Dental Corps of the Navy is a part of the Medical Department of the Navy, the details of its administration, including the assignment and transfer of dental officers, the care of dental property, the supervision of reports and returns, etc., have hitherto been handled in the bureau in conjunction with the routine administration of other Medical Department activities.

The designation of a dental officer to supervise the routine administration of dental matters was considered advisable on account of the technical nature of the dental service rendered to officers and men of the Navy.

The dental division has been functioning as such for some time and has been very successful in the administration of the affairs of the Dental Corps.

The division as arranged has cognizance of and supervision over dental material and dental personnel and the inspection of dental activities. This latter duty is proving to be of considerable value to dental officers, as technical information concerning the care and condition of the equipment in use has hitherto been difficult to obtain by methods previously in vogue.

As now organized, the dental division has supervision over all matters concerning the Dental Corps, directly under the Surgeon General, who has demonstrated in many ways his interest in its efficiency and importance.

The dental officer in charge of the new division bears the same relation to the Chief of the Bureau of Medicine and Surgery as the officers in charge of other divisions. He prepares for the Surgeon General all recommendations concerning the changes of station of dental officers and attends to all correspondence concerning dental matters of personnel and material. He acts as an advisor to the Surgeon General in matters of policy, represents the bureau in its relations with the Naval Dental School, and in other educational

matters. He has cognizance of requisitions for dental supplies which are sent to the bureau for approval, and is responsible to the Surgeon General for the character and kind of dental service given.

The establishment of the dental division of the Bureau of Medicine and Surgery is a source of considerable satisfaction to both medical and dental officers, as the former are relieved of some of their responsibility in purely dental affairs, and the latter are greatly encouraged by having a member of the Dental Corps detailed to care for their technical needs.

A plan for extending to the officers and men of the Navy a less limited service, to include prosthetic procedures when indicated, is being tried out at the Navy Dental School, along lines which have been prepared by the dental division and approved by the Surgeon General. An accurate account of the cost of this service is being kept as the basis for future estimates on an extension of this work.

Information concerning the dental division as now included in the bureau's organization has been furnished the American Dental Association, and the bureau is in receipt of an acknowledgment from the secretary with the statement that proper action in appreciation of this official recognition so long desired by the dental profession would be forthcoming at the next national meeting.

MORE DENTAL OFFICERS NEEDED IN THE NAVY.

There are 149 dental officers in the Navy. They are required to furnish dental service to approximately 116,000 officers and men, which includes the Marine Corps, prisoners, midshipmen, nurses, and reserves on active duty. This means that the service of one dental officer should be available to every 778 men.

Each dental officer is entitled to 30 days leave each year. If this leave is taken, the Navy is continually deprived of the services of $12\frac{1}{2}$ dental officers, which reduces the number on continuous duty to $136\frac{1}{2}$ officers.

Twenty-four dental officers are employed on foreign duty on the Asiatic station and in other places, and each of these officers is transferred at the end of a two-year cruise. The time consumed in effecting these transfers is considerable, two months being a low estimate of the time required in each case to transport a dental officer to foreign duty and to bring the officer relieved back to the States.

These necessary changes operate to deprive the Navy of the services of these 24 officers for 48 months every two years, or 24 months each year, which further reduces the number of dental officers continuously on duty to 134.

Two of the dental officers now carried on the active list are in hospitals, the result of medical surveys which are expected to result

in their retirement, which further reduces the number available for continuous service to 132.

Resignations from the corps has reduced its number during the past year from 157, its strength at the commencement of the present fiscal year, to 150, and it is assumed that an average of 4 resignations each year should be anticipated.

One dental officer has been retired this year for disability incident to service.

No vacancies existing in the Dental Corps are being filled. Its strength is based on the proportion of 1 dental officer to every 1,000 officers and men, which in turn is based on the authorized strength of the Navy and not the actual strength. On the basis of the authorized strength the Navy Dental Corps has a percentage of 80 per cent now in the service, which compares very favorably with the proportionate strength of the line and Medical Corps. The proportion of line officers on duty to the authorized strength is about 77 per cent and the proportion in the Medical Corps about 64 per cent. It has not been thought advisable to increase the strength of the Dental Corps until the proportion of officers on duty in other corps is brought to a point equal to the present proportional strength of the Dental Corps.

It is apparent, however, that the basic proportion of 1 dental officer to every 1,000 officers and men is far below the proportion necessary to furnish the required amount of dental attention. This fact has been recognized by the Surgeon General, who has already informed the Naval Committee that the proportion of dental officers should not be allowed to drop below the rate of 1 dental officer to every 750 officers and men, this estimate being based on the character of dental service then rendered.

The statement of existing conditions shows that in effect 1 dental officer is available for every 878 officers and men, and this estimate can again be lessened by the necessity of maintaining 3 dental officers on a duty which keeps them away from the dental chair, 1 officer in each of the naval medical supply depots where dental supplies are purchased and issued, and 1 in the Bureau of Medicine and Surgery in charge of the dental division.

Taking into consideration the probable resignations from the corps and the administration duties of 3 dental officers, the actual number of dental officers available for continuous service at the end of the next fiscal year should be 125, which is a proportion of 1 dental officer for every 920 officers and men.

This proportion is estimated as available under ideal conditions, which presume that officers and men are so grouped as to be accessible for dental service. This condition will probably never prevail in

the naval service, due to the necessity of maintaining a certain number of more or less isolated stations where the complement is small, the services of civilian dentists not available, and the need of dental service as great in proportion as the requirements on the larger stations. In such places dental service has to be provided, and, due to the isolated situation, this service in some cases is made available to the families of officers and men which are stationed there for duty. When this condition prevails it operates to increase the requirements for dental attention and further lessens the proportion of dental officers available for the general service. Quantico and Parris Island are two of the stations considered as isolated stations in respect to dental treatment. At both Quantico and Parris Island the supplementary personnel is large and constitutes an appreciable factor in the problem of furnishing emergency dental treatment.

In smaller more truly isolated stations the personnel is less than that proportion considered adequate for one dental officer to serve. It is necessary, however, to maintain a dental officer on duty at these places, and this operates to furnish to the smaller isolated stations better dental attention than can be given at the larger stations, which are deprived of their proper proportion of dental service by reason of the necessity of detailing dental officers to these smaller stations.

It is, of course, inadvisable to cease to supply dental attention to the smaller stations in order to further extend this service at the larger stations, and it would therefore seem that there can be no solution to the problem of furnishing the required amount of dental service to the Navy except to increase the size of the Dental Corps.

While recognizing the inability of the present number of dental officers to adequately furnish the proper dental attention to the service based on the character of the work now authorized, the Bureau of Medicine and Surgery is making an earnest effort to make available to officers and men dental service of a less restricted character, with the object of being ultimately able to furnish to the personnel of the Navy the best attention the profession affords.

This prospective increase in the scope of the dental service given is seriously handicapped by the size of the corps, it being obvious that if difficulty exists in performing the duty now required, any addition to this duty will make the problem even more difficult. It is realized, however, that the matter of the size of the corps is something over which the Bureau of Medicine and Surgery has little control, while it is vitally interested and directly responsible for the character of the service rendered.

Believing that no restrictions should define what may or may not be done in order to maintain the health and morale of the officers

and men that professional thought and skill deems best for them, an extension of the dental service to include all that can be obtained from dentists outside the service is being tried at the Dental School and laboratory with a view of its general adoption. The adoption of this additional work as a part of the duties of dental officers will further emphasize the necessity for increasing the size of the corps, and the concrete value of this work to the service generally should offset the expense entailed in increasing the number of dental officers to a number sufficient to perform it.

In arriving at an estimate of the number of dental officers the service needs in order to carry on its present duty, and the additional work contemplated, there is no reliable data or statistics available, but it is generally considered that a proportion of 1 dental officer to every 350 officers and men would be none too large.

NOTES AND COMMENTS.

The Medical Research Council of Great Britain, in consultation with the Ministry of Health, appointed a committee in July, 1921, for the investigation of the causes of dental disease. We learn from the British Medical Journal of March 3, 1923, that the committee was asked to advise the council upon the research work in this subject already aided by the council and to initiate further researches. The first report of the committee, *The Structure of Teeth in Relation to Dental Disease*, by Dr. J. Howard Mummery, which document is also known as Medical Research Council Special Report No. 70, has recently been issued.

In it the committee indicates its intention to issue reports upon other parts of the subject from time to time. Doctor Mummery has considered his subject in three aspects: First, variations in the composition and structure of enamel and their relationship to dental caries; secondly, the production of artificial caries; and thirdly, arrested caries. Under the first heading he inquires whether enamel is entirely inorganic, and whether it is incomplete at the time of eruption and capable of further consolidation from without. Owing to the difficulty of microscopic examination of enamel, there are wide divergencies of opinion. Tomes is quoted in support of the view that there is no organic matter in enamel, whereas Lovatt Evans holds that there is 1 to 2 per cent. Unfortunately, no explanation of these divergent findings is attempted. In discussing the second question he quotes one experimenter (Head) as of opinion that progressive consolidation may occur from dialysis of lime salts through Nasmyth's membrane, and another experimenter (Pickerill) as unable either to confirm or refute the experiments on which this opinion is based. The possibility of further consolidation from within, on the same lines as that seen in the enamel of sargus, is indicated by certain microscopic appearances of the amelo-dentinal junction—spindles and bundles of apparent fibrils which take a stain. The possibility of further consolidation of the enamel after eruption of the tooth may prove of great import in the prevention of dental caries; Doctor Mummery's attitude is noncommittal, and does not inspire much hope. From the report it is not easy to gather what variations are considered normal and

which are defects, but the impression given is that if the teeth are kept clean the variations are all immaterial. The report on the production of artificial caries is chiefly historical. It is short, but brings into prominence the chief workers in this field, giving honor where honor is due. The important point is that caries "indistinguishable both macroscopically and microscopically from natural caries" has been produced in the laboratory by initiating ordinary food stagnation in the human mouth. The section on arrested caries of the teeth does not seem to warrant the hopeful attitude taken up by some of the lay press. It is pointed out that the stained surface of dentine showing arrested decay is more resistant to acid than unstained dentine, and that beneath this is a "translucent zone" of dentine also more resistant to acids; but it has to be admitted that unless the enamel be removed around and beyond the area of decay, decay will spread laterally in the amelo-dentinal junction, and what is gained in one direction will be lost in another. The comparatively insensitive temporary teeth may lend themselves to this very old treatment of "filing out the decay," but the sensitive permanent teeth present quite another problem. Certain appearances found by Doctor Mummery in sections of decaying enamel suggest that in this tissue also a translucent zone may be formed. The suggestion is that this, like the translucent zone of dentine, may represent a vital reaction and an attempt to interpose a barrier of more fully calcified tissue to the advancing caries; but Doctor Mummery asks for further investigation before drawing any such conclusion. The report is beautifully and pertinently illustrated, and is provided with a list of references.

Reliable statistics of the prevalence of disease of the teeth and much data concerning the immediate cause of tooth decay is available for the use of dentists who are interested in the prevention of dental disease as well as in the various reparative procedures made necessary by dental disease. In particular the last few years has furnished data of value in connection with the examination of young men for the Army and reports are available, for age periods up to 8 years, from clinics conducted for children. If these reports are to be accepted as representative of conditions existing throughout the land, then the efforts of the dental profession must be directed to some efficient method of preventing such conditions. The limited output of reparative work in the face of the increasing national prevalence of these diseases is but a sorry outlook. Education of the individual would seem to be the only hope. Fones, of Bridgeport, Forsyth, of Boston, and Eastman, of Rochester, are outstanding examples of pioneers in the education of the individual toward the prevention of dental disease. Reports of their results in greatly

lessening retardation of children in schools, with a consequent decrease of municipal expense, are so manifest that many large cities are preparing to institute thoroughly equipped dental clinics as a measure of economy in reducing the total of the educational budget.

An era of much larger possibilities in the direction of the prevention of dental disturbances appears to have dawned with the work on nutrition instituted by McCollum and his associates in 1910. A broader view of the subject becomes possible as more detailed information along this line becomes available. The reader is referred to the contributions on this subject by McCollum, Grieves, and Howe, for the details of laboratory experiments of a very illuminating nature. While these authors do not draw dogmatic conclusions to the effect that a certain diet will result in the lowering of immunity against and the institution of a predisposition toward dental and peridental pathology, the summary of their results seems to indicate that important results and conclusions may yet be reached. The baffling etiology of pyorrhea may yet be worked out in the biological laboratory.

Grieves, working in conjunction with McCollum in the laboratory of the department of chemical hygiene and public health, Johns Hopkins University, has examined the teeth and skulls of about 1,300 experimental animals representing a wide range of modified diet. In this series were found duplicated lesions of human dental defects, caries, exposures of the pulp, and abscesses of the apices. The significant fact in this observation is that control animals under a balanced diet were free from such conditions.

As a matter of interest in relation to a diet for man, McCollum recommends a larger reduction in the consumption of sugar, a liberal consumption once a day of leafy vegetables such as cabbage, spinach, Brussels sprouts, turnip tops, dandelions, etc., as well as very liberal amounts of milk and its products.

Howe has demonstrated with biological experiments that teeth affected with caries resemble bone which has undergone pathologic decalcification. There is about twice as much magnesium present as is found in sound teeth, a like condition existing in bone under similar circumstances.

While the above observations have not demonstrated that decay is not a result of bacterial invasion, they should be very valuable in focusing attention on the much larger aspect of immunity, both dental and peridental, in relation to diet.

Not infrequently we hear of a new idea or invention which subsequently proves to be one which, so to speak, is in its second reincarnation, having been dropped the first time through neglect or its failure to realize expectations. As an interesting example of this

we find an article by Dr. Meyer L. Rhein in the September, 1922, *Journal of Dental Research* in connection with the treatment of pulpless teeth. According to statements contained therein the author and collaborators as early as 1885 were interested in asepsis as applied to root canal work. The crop of abscesses which followed their procedures, however, discouraged further activities in that direction. W. Clyde Davis recently called our attention to pulp amputation, under aseptic conditions, as the result of which new cementum he thought might be expected to seal the foraminal entrances and block the canal. This is the second reincarnation of such a procedure, and the method is strongly denounced by Doctor Rhein in view of his past experiences along similar lines. Microscopical examinations show that instead of a deposition of cementum under such circumstances, a substance is sometimes formed which should be termed calcific degeneration, and this has the disadvantage that here and there throughout the mass organic layers exist which easily become the seats of infection.

Mummification of pulp tissue was extensively advocated in 1885; and being so temptingly easy of execution, it was no doubt responsible for a lack of effort on the part of many to perfect a canal technic, even of the most elemental sort. So eminent a man as the great Miller, of Berlin, advocated mummification in the *Dental Cosmos*, and who can blame the lesser light for following his advice. Time, with the assistance of radiography and an increased knowledge of the cases of disease, has enlightened the present generation as to the results to be expected from the mummification of dental pulps.

The advocacy of Callahan about this time of the use of sulphuric acid for enlarging root canals was a step in the right direction, but this was found not to remove every particle of pulp tissue.

In 1893, Schrier, of Vienna, gave a clinic at the International Dental Congress in Chicago, and at which the attention of Doctor Rhein was attracted to the mixture of sodium and potassium. The clinic was held to show the value of this material as a mummifying agent when packed into the root canals. Doctor Rhein observed, however, that it destroyed every vestige of pulp tissue with which it came into contact in the canal. Here was a material for which he had long felt the need. He has used this mixture since that time, and the results of his years of experience are at our command. His conclusions are that it should be used to remove every particle of pulp tissue either vital or nonvital. To obtain the maximum benefit of sodium potassium it should be passed through the foramen. This is in direct opposition to the general opinion as to the use of this substance, as one of the precautions for its use has invariably been not to get it through the foramen on penalty of severe pain. Pos-

sibility of pain from the presence of the mixture outside of the foramen may be discounted by blocking off the area with novacain.

Sodium potassium in the hands of the dentist is compared to the knife in the hands of the surgeon, and Rhein believes that the safest way to treat canals is to open them thoroughly through the apex and, after extended ionization with iodine, to fill them hermetically with chloroform and gutta-percha. A protrusion of the semisolid mass through the foramen during the filling is made for the purpose of covering any denuded cementum as well as of making a definite seal for the foramen of the canals. He contends that this procedure in his hands has been successful in cases which otherwise would have required amputation of the roots. Rosin as a component of canal fillings should not be used, as it serves as a medium for the growth of bacteria.

In every operation on the living body a certain percentage of failures can be expected, and the tooth is no exception. The patient should be acquainted with the reasons for failure and the danger of retaining nonvital teeth.

Doctor Rhein's opinions conflict with those advanced by Grieves and Groves. The latter advocates that the nerve be removed to the constriction where it most readily breaks, the cemental junction, and that the canal filling be inserted just to this point, avoiding injury or disturbance of the cementum or peridental membrane. Rhein believes that even in the absence of infection the hermetical sealing of the entire canal serves as a great prophylactic measure.

Histories of several cases are given in Doctor Rhein's paper, with radiographs, and these cover root fillings which have been in place as long as 32 years.

The proof of the pudding is in the eating, and we must give thought to the methods of root canal work which are standing the test of time.

Lieut. Commander A. G. Lyle (DC), United States Navy, the senior dental officer on duty at the United States naval training station, Newport, R. I., has developed a type of wall attachment for the electrical connections of the standard Navy dental equipment which has proved to be compact and useful ashore, and which will probably prove of advantage at sea.

The chief value of the new type of attachment lies in the fact that it requires but one opening through a wall or bulkhead for the passage of wires for connection with all electrically operated equipment in the standard office.

The fixture itself is somewhat similar to the small type of switchboard, in the center of which is attached the connection of the electric

engine. A socket at the top of the board furnishes a receptacle for the Cameron mouth lamp, and two rows of three ordinary plug connections are provided for the attachment of the leads to the sterilizer, fan, unit, dental light, heater, etc. The fixture is attached to the wall directly in front of the operating chair and is a decided improvement in appearance and general convenience over the methods ordinarily employed.

In a history of dentistry compiled by Dr. Vincenzo Guerini, of Naples, Italy, and published in this country under the auspices of the American Dental Association, considerable space is devoted to the achievements of Pierre Fauchard, 1690-1761, the founder of modern scientific dentistry, a well-authenticated copy of whose portrait was recently presented the Navy Dental School.

Fauchard's work, published in 1728, marks an epoch in the history of dental art. As Fauchard was the first to publish his experiments in prosthesis, it is interesting to note his methods in the prototype of modern bridgework. Guerini states:

"According to the circumstances, Fauchard used, for maintaining artificial teeth in their place, linen silk, or gold thread, passed through holes made in them, and tied to the natural teeth.

"When a set of two, three, four, or more teeth was to be applied, Fauchard first prepared them separately and then united them together by means of one or two threads of gold or silver in such a manner that the set formed at last a single piece, which was then fixed to the natural teeth. When the piece consisted of several teeth it was reinforced with a small plate of gold or silver fixed to its inside by means of small tacks of the same metal riveted on one side to the plate, on the other to the front part of each tooth."

The author remarks that a similar prosthetic piece lasted longer than others previously described, but required proportionately much more work and much greater expense. He adds that by employing this plate one can even dispense with threading and fixing teeth together with gold or silver wire; but that it was then necessary to make a horizontal groove at the back of each tooth corresponding to the width and thickness of the plate, which could be fitted into the serial groove and fixed to each single tooth by means of two small rivets.

Fauchard describes his method of crown emplacement as follows:

"When one wishes to apply an artificial crown to the root of a natural tooth, one files away the part of the root that emerges above the gum, and even more if possible. One then removes, with proper instruments, all that is decayed in the root itself; after which one stops the root canal with lead and fits the base of the artificial tooth

to the root in such a manner that they correspond perfectly to each other. One drills one or two holes in the tooth through which to pass the ends of a thread, which serves to fasten it to the natural teeth on each side of it, as described above.

"If the root canal has been very considerably enlarged by the carious process, so as to have rendered it necessary to stop it, the root being, nevertheless, still quite steady, one bores a small hole in the lead as deep and as straight as possible, without, however, penetrating farther down than the root canal. The artificial crown is then united to the root by a pivot."

Fauchard held the title of "surgeon major of the King's vessels" and is thus heralded as the first naval dentist.

In a lecture delivered in Washington recently before a joint medico-dental meeting and attended by a representative gathering of both professions, Dr. Lewellys F. Barker, of Johns Hopkins Hospital, emphasized the importance of a better understanding of the interdependence of the two professions and instanced the necessity of cooperation between the dentist and physician by observations taken from his own rich experience in support of his theme.

The standing of the lecturer in the medical world gave his remarks significance and importance, and his acceptance of the value of dental service as a factor in diagnosis and treatment brought home to his hearers a better appreciation of the necessity for a correlation of all factors which may have a bearing on cases presented, and a consideration of the relative importance of each in arriving at the proper treatment to be instituted.

"Rows of imperfect enamel development leads one to suspect parathroid deficiency with danger of development of tetany," said Doctor Barker.

"Hague teeth—wide centrals, with a space between—means often early overactivity of the pituitary body, and the relative size of the laterals and centrals may indicate thymus derangement with risk of sudden death in anesthesia.

"Neurologists are interested in impacted molars and their relation to reflex neurosis," said Doctor Barker, but he observed that he had not noted this connection to any extent, although probably not all patients with unerupted and impacted teeth have a tendency to reflex neurosis. "The greatest interest is in oral sepsis, of which acute and chronic periodontitis, gingivitis, and pyorrhoea are particularly important and easy to demonstrate.

"In arthritis we seek for the primary focus responsible for metastasis. Some results from extraction have been brilliant; others are

not followed by the results hoped for. The truth probably is that after the joints have become infected we may have foci in the joints themselves. Thus the primary foci may be relieved, but we have to look for the secondary which may exist—this usually requires long orthopedic treatment with methods employed for raising the general resistance."

Doctor Barker did not ascribe all arthritis to oral foci of infection, as seems to be the tendency of some enthusiasts, but included the tonsils as common sources of infection, especially in children. He said, however, that in adults the majority of arthritic cases could probably be ascribed to the teeth as well as many cases of myositis and fibrositis.

He mentioned embolic pneumonia as sometimes secondary to oral foci of infection and subacute endocarditis, with the explanation that *Streptococcus viridans* may attack the heart valves damaged by an old rheumatic lesion, but said that as a general rule the *Streptococcus viridans* did not attack the heart valves unless some deficiency existed. He included iritis as resulting from oral infection, but remarked that it had been his observation that the percentage of cases in which oral foci was clearly responsible was small.

"Catarrhal gastritis may result from swallowing pus," said Doctor Barker. "This may be associated with increase or decrease of acid. The lower urinary passages may be infected secondarily. Arteriosclerosis and high tension may be the result of a secondary anemia caused by or associated with primary infection in the mouth."

Doctor Barker thought that pernicious anemia occurred independently from oral sepsis.

Psychosis neurosis, Doctor Barker thought, bears some relation to oral sepsis. He had not personally observed cases directly traceable to oral sepsis, but said that it unquestionably is of value to put the mouth in proper condition in these cases.

"Physicians are often too trustful of statements of patients that their teeth are in normal condition," said Doctor Barker. "They should have the services of dental diagnosticians, including X rays. In case of disagreement of opinions, I consider my duty as follows:

"First, to patient; second, to my colleagues; and, third, to myself.

"In all this work the extremes are to be avoided and the middle path chosen. Never remove a tooth unless it is a menace.

"Oral sepsis is only one factor to consider in blood pressure; arteriosclerosis means changes in arterioles, and a high blood pressure may be necessary to certain individuals. If 180, 200, or 220 chronic tension is noted, removal of oral sepsis takes off part of the load."

The mutilation of teeth in order to prepare them for the adjustment and retention of bridgework is a subject which is disheartening to a conscientious practitioner. Doctor Ottolengui, editor of *Dental Items of Interest*, attempted a survey of the radiographic findings in a large number of cases in which bridgework of the fixed type had been inserted some time previously. The cases were drawn from the offices of representative men of the profession; not picked as to good or bad, but simply as a series of cases from the files of each of the men concerned. The exact conclusion reached is not at hand, but as recalled approximately 90 per cent of the number studied showed deviation from the normal, either in respect to periodental or apical disturbances. A number of factors no doubt contributed to the sum total of such appalling figures.

Fixation of the abutments is mentioned as a possible injurious procedure, as in a normal dentition each tooth has individual movement in mastication, limited by the integrity of the periodental membrane, the contacts with adjacent teeth, and the planes of occlusion. It has been advanced that the fixation of even two teeth together will definitely limit their movements in view of the fact that occlusal stress is presented in a characteristic direction for each of the 32 units. A deviation from normal is classed as pathological, and in this light fixation can not be classed as normal.

The mention of gingival irritation will suffice for the members of the dental profession recalling the requirements in this direction in the placement of bridges, although an effort toward the obliteration of this common condition is now being sought in the use of inlay and three-quarter crown abutments. As is well known, it is only by the exercise of the most unusual skill that gingival irritation can be obviated as the result of the usual bridge restoration. Experience has shown that long-continued gingival irritation is the almost universal cause of periodental disturbance, and once the integrity of the highly specialized periodental membrane is destroyed it is gone forever.

Interferences with the normal function of the periodental membrane may take the form of overload, even after deducting the percentage loss of function attributed to fixed prosthetic appliances, and in addition the factors of torque, plane inclination, and lever forces are often present or develop. Under this head improper occlusion also deserves a place, as it is one of the most important phases in the insertion of any appliance, particularly more so perhaps when a rigid restoration is inserted, as there is no compressibility other than the very limited amount afforded by the periodental membrane itself.

The sacrifice of tooth structure necessary to prepare a tooth to receive an abutment piece is considerable, and, to say the least, results

in a change of environment for the tooth. The practice of the preparation of abutments under novocain anesthesia makes possible shock to the pulp from the removal of an undue amount of dentine.

Numerous appliances have been devised to meet one or several of the objections presented above; the one which seemed to meet with the most widespread popularity was the Nesbit cast clasp. A wrong conception of the principle of this clasp, that is immobility on the tooth, seems to have been prevalent, and this with failure to instruct the patient as to the vital necessity for proper maintenance of cleanliness has resulted in decay under the area clasped in innumerable instances, giving rise to the statement that after two years' use an area of decalcification may be expected to outline the surface of the enamel covered with the clasp.

A replacement of lost teeth without mutilation of the remaining members either as to form or function would seem to be a very desirable way out of the pitfalls besetting the insertion of bridgework. With such a goal in view the work of Dr. W. E. Cummer, of the Royal College of Dental Surgeons, Toronto, Canada, is extremely important and timely. To this indefatigable worker we must credit in a great measure the scientific classification of partial denture service. To so many, partial plates convey the idea of false front teeth, inopportune dropping, and general clattering that their very mention will cause an almost involuntary shake of the head. A convert, however, can usually be made by an explanation of the subject, excepting, of course, those with fixed ideas.

Doctor Cummer's work embraces some 65,000 possible variations and requirements encountered in partial denture service. In this respect he stands in a somewhat similar position as Doctor Angle before and after his classification of the chaos existing in orthodontia. The former has outlined simple principles of procedure in partial restorations and has succeeded in making them accessible for the practitioner who has not time for extended study. One of his most striking statements is made in regard to cast clasps: "Cast clasps must not be used in any instance which, because of relative nonresiliency and consequent lack of slip, they may subject an anchor tooth to vertical or horizontal torques from free saddles on mucosa of any degree of compressibility." This opens a field of thought for those who pride themselves on their ability to make a cast clasp which snaps to place about the tooth and thereafter moves only as the tooth moves. He brings out the point that a clasp should have movement on the abutment similar to that of a ball and socket joint, the contour of the tooth representing the ball. This in turn makes a clasp of this description not adaptable to a tooth without convexity, as no motion is possible on such a tooth except removal.

The end result of the application of a cast clasp to a tooth of this description under the circumstances stated is the eventual loss of the tooth.

One of the most interesting phases of the work of Doctor Cummer is that relating to the application of indirect retainers, with which by means of extensions of 14-gauge wire to rest on teeth other than centrals and laterals, he obtains stability for dentures, both upper and lower, to a degree hitherto unobtainable.

The location of direct and indirect retainers are based on sound engineering principles and depend upon bringing the fulcrum line in center of area of piece.

Experience and practice are necessary to master any technic, and the advantages of that offered by Doctor Cummer seem to give promises of such superior partial restorations that patients may be well advised to keep such teeth as they have intact and free to function normally.

In a lecture by Capt. F. E. Rodriquez (D. C.), United States Army, delivered before the District Dental Society in Washington, D. C., recently, Doctor Rodriquez alluded to the difference in the tooth structure of patients between the ages of 8 and 18 and that of persons 36 or thereabouts. He remarked the difference in the size of the dentinal tubules, that of the older tissue being less accessible to the invasion of bacteria due to the constriction of these tubules and the absence of sufficient nutritive material to facilitate bacterial growth. He also mentioned in a brief way that classical conformity to this general rule has been noted in cases of pregnancy, but did not elaborate on this observation. Doctor Rodriquez's work in the further classification of acid-producing bacteria and their selective action as one of the predisposing, if not the direct, cause of dental caries is a valuable and original contribution to dental bacteriology, and is regarded as being the most authoritative contribution in this direction since the work of the late Dr. W. D. Miller.

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THE DIVISION OF PREVENTIVE MEDICINE.

Lieut. Commander J. R. PHELPS, Medical Corps, United States Navy, in charge.

Notes on Preventive Medicine for Medical Officers, United States Navy.

INSTRUCTIONS TO MEDICAL OFFICERS.

SOME SOCIOLOGICAL AND PSYCHIATRICAL ASPECTS OF THE VENEREAL DISEASE PROBLEM.

By Paul E. Bowers, M. D., regional consultant, United States Public Health Service.*

Mankind is continually being stimulated and propelled along by three great primary urges; the urge of food, which finds expression in the various forms of plant and animal culture; the urge of the ego, which pushes man on to the development of his capacities which are shown in the accomplishment of art, science, and commerce; and the urge of sex, which exhibits itself in its highest form as the family unit, the basis of municipal, State, and Federal organizations.

The proper and intelligent regulation of these urges leads to the attainments just spoken of above, but the imperfect regulation and the unwise inhibition of them leads to disasters which affect the family and social units, and this is particularly true in relation to the sex urge. While we are not in total accord with the theory propounded by Freud, that the only and the predominating force of life is the sex urge, we are compelled to admit that the urge of sex is very tremendous. One of the greatest problems confronting us, and one which seems to be undermining our social institutions, is the existence of prostitution (which may be regarded as a perverted expression of the sex impulse), and the venereal diseases which corrupt the family unit and cause such contamination as is shown in the withering blight of insanity, feeble-mindedness, epilepsy, and moral degeneracy.

The urge of sex is twofold in its manifestation; the first is the conscious desire of pleasure, the second is the unconscious expression of nature for reproduction. Nature has wisely provided that the

*Reprinted from "Venereal Disease Information," Vol. IV, United States Public Health Service.

sexual act be attended by pleasurable sensations and emotions, securing thereby perpetuity of the race, even when this thought of reproduction plays no part in the accomplishment of sexual relations.

In studying the problems of venereal disease and prostitution we are compelled to view these problems from various angles if we are to understand them and to deal with them wisely. Preconceived medico-theological or moralistic dicta have not and will not solve the problem. The solution of these vexing situations demands a careful consideration of all angles of this social dilemma in a cold, dispassionate manner, with the ultimate good of the social unit as the goal idea of attainment. Our social order seems to grow more complex each day, and with its increasing complexity we find that there is a corresponding increase in the factors influencing the sex urge. A number of these factors will be considered very briefly.

Dance.—What is the influence of the modern dance on the sexual urge? Does the intimate contact and close bodily associations of the modern dance awaken or kindle, consciously or unconsciously, the sexual passion? Are the modern dances, as we see them danced in the public dance hall and public ballroom, to be regarded as pure, unadulterated expressions of rhythmic grace, devoid of sexual coloring or emotion? To the tom-tom music of the jazz orchestra the observer may find that couples pass by him in intimate embrace, in cheek-to-cheek fashion, hopping, twisting, and turning to the rhythm of syncopated music. What are the emotions of the sophisticated youth in such situations? Is this type of dance universal, and is it a reversal to the type when some ancient jungle tribe hopped, toddled, twisted, rocked, and howled about the tribe musician as he beat on a hollow log, producing with his club monotonous tom-tom, characteristic of our modern jazz? These dancing orgies of the primitive man had definite purpose of propagation. Have the grace, dignity, and refinement of the Virginia reel and the square dances been imitated in the modern day ballroom? The answer is in the negative. It is certain that the dance of to-day, as performed in the majority of places, does not have a tendency to diminish or regulate the normal sexual urge. The reverse is quite true in many instances. We may paraphrase Shakespeare and say, the motto of to-day is "On with the dance, let joy be unrefined."

Modern dress.—As to what extent modern dress affects the sex urge is decidedly a mooted question. There can be no dogmatic answer. It has been urged upon us by the proponents of the ultra-modern day styles that such styles are modest in the extreme and are particularly beneficial to the female in allowing full freedom of motion of the limbs, and are decidedly sanitary inasmuch as they do not sweep the streets of dirt and filth. The opponents of the extreme types of dress are equally firm in their beliefs that dresses

which reach the ankle are as effective in matters of sanitation as are skirts which reveal the wearers' knees at every step. Those approving of the extremely décolleté cut of gowns have urged that such dresses gave freedom to the throat, hardened the skin of the neck and chest, and thereby prevented the development of colds and pneumonia; those who oppose such views are earnest in their contention that dresses cut so low as to suggest exposure of the secondary sexual characteristics are not conducive to good health or good morals. It has been quite apparent that prostitutes, knowing of the value of sex appeal in dress, have in plying their vocations assumed the extreme and risqué styles of clothing. On the other hand, perfectly normal women, blindly following the decrees of fashion, have dressed and are dressing in the most suggestive styles, whether these skirts be long or short. Some of our school authorities and some of our clergy have placed modes of suggestive dressing under ban. Teachers have been instructed to appear in their classrooms in modes of clothing which did not stimulate sex ideas, and communicants of certain churches have been denied certain church privileges unless they dressed modestly. It is a well-known fact that the love of finery in the matter of clothing has led the shop girl in many instances to stray from the path of virtue.

Within the last few years, it would almost seem to be true that the theater, which performs so great a function in the education of the public, has been more or less corrupted and betrayed for a price. Licentiousness has run riot on the stage. Bedroom dramas have been exceedingly popular, and even the so-called problem plays have been baited with juicy bits of sensuality to form bacchanalian feasts for the eyes and imagination of the adolescent boy and girl and the more mature adult, who are fired thereby to sexual indiscretion. Many plays which are fairly decent, except as to title, have found these suggestive titles lucrative drawing cards. It is a well-known fact that smutty jokes, as a rule, even in our so-called exclusive theaters, often gain tremendous applause, and it is to be observed that persons clap their hands in great approval and apparent enjoyment, and yet it is quite true in many instances that if these remarks were heard on the outside those same individuals would seriously disapprove and condemn.

The virtue of the mob, as well as the intelligence of the mob, is lower than the moral or mental levels of the individuals which compose it. Psychoanalysis has revealed that suggestive and smutty plays have afforded many persons a vicarious mode of sexual gratification. The trash-laden novels and the stories printed in many of our cheap popular magazines are devoured with great eagerness for the same reason. I found on inquiry at a bookstore near a great uni-

versity that the greatest number of the risqué magazines were sold to the female students of this university. These practices have afforded sensual gratification in ways that do not bring immediate social retribution; however, they pave the way for sexual promiscuity when the compunctions of conscience have been lost or the fears of disaster dispelled.

General decadence of morals.—Bad companionship, vicious associations, idleness, frivolity, excessive love of pleasure, continuous desire for excitement to appease an hysterical and unsatisfied craving for excitement and novelty, which inevitably lead to promiscuity, are among the potent factors responsible for the reduction of our moral level. An examination of our divorce-court records will prove the correctness of this contention, as will a glance at the headlines of our daily newspapers. A growing lack of proper regard for moral and religious teachings engenders a disrespect for the seventh commandment, which is consequently broken. Intemperance, as we all know, has long been a prolific source of sexual immorality. In recent years the taxicab and the automobile have played no insignificant part in sexual promiscuity. It is not prudish or Comstockian to recognize the fact that there exists to-day a tendency to exploit the natural sexual impulses for commercial gain. On the stage and on the screen, in the public dance hall, in our books and magazines, there is definitely expressed a purpose to turn our sexual interest and curiosity into hard cash. Our so-called classical and interpretative dancing, with its suggestive gestures and inanities, our leg shows, our excessively short skirts, and peek-a-boo waists and the decrees of Dame Fashion are not all the results of desires to express the ideals of art. These factors do stir up the ardor of the sexual urge, as every student of social life knows. Possibly Nature has wisely ordained that these manifestations of sexual expression shall exist as an effort of self-assertion against the undue repressions put upon her by the social restraints of our civilization. Yet, we must view with skepticism all efforts to commercialize the sexual passion.

The psychology of Freud.—The advent of Freudianism has been attended, together with a few benefits, by numerous evils. Psychoanalysis has become a widespread fad and is a subject of discussion in thousands of lay women's clubs. Even some of our universities have introduced into the classroom the study of Freudian psychology with its perverse sex emphasis, and the immature minds of the students have been saturated with ribald sexuality and obscenity to the last degree under the guise of the study of psychology. Under the same mask of science, this psychology of Freud, which occasionally has a legitimate use in medicine, has been peddled over the world and many books and articles upon this subject have flooded our

libraries. Many of these books may be properly regarded as vile and pernicious and would be excluded from the mails, except for their presumptuous claim of being scientific. The books of Freud and those of some of his rabid disciples are eagerly devoured by members of lay clubs as well as immature minds in our colleges and, because of this mental pabulum, the readers suffer from intellectual indigestion, and as a general result there is a general lowering of the moral tone of the readers who have indulged in this conventional sexual orgy. The ethics and virtues of our forebears, which have elevated the race to whatever moral heights it may have attained, are now looked upon by the youth, vitiated by the evils of Freudian psychology, to be but sexual repressions and inhibitions. Likewise, religion in general has come in for its share of psychoanalysis, and this great moral police force and mental balm of the world has been reduced by the narrow type of Freudian to codified systems of sex symbolisms. In fact, the mental myopia of some of the Freudians has become so great as to lead them to perceive every ethical and social institution to be but an expression of sublimated sex instinct. Views of this sort lead to promiscuity in those social levels where we ordinarily expect to find the highest types of sexual ethics and culture.

Marriage.—Under existing economic and social conditions, marriage can not always take place at the time physical and mental attainment has made such a union desirable or possible. The more or less artificial social and economic conditions imposed by society do not change the nature of mankind. In humanity there is planted inherently a love of the opposite sex, and if the longings and desires of natural instincts can not find expression soon after the age of maturity, disasters and troubles appear in due course of time, and the moral and social customs which have been laid down are violated and trampled upon. When we strip all emotion from the question we are bound to admit that the lack of opportunity for early marriage increases sexual promiscuity and consequently venereal disease. Those who are alert to the problems of sexual life are aware of the mutterings, murmurings, grumblings, and unrest which exist because of our standards of social ethics, and these expressions are to some degree prophetic of the changes which may come in an evolutionary manner to our existing social condition. Biologic and ultra reformers are about on every hand, ready to provide society with their materialistic, biological schemes to remedy the evils of marriage, but these would promptly work disaster. No matter how we may feel about it, or how disagreeable the fact may be to us, it is an established fact that sexual liaisons are growing in number, and particularly among the men and women in the industrial and com-

mercial world, and these liaisons terminate in separation, pregnancy, or marriage, according to the dictates of the parties concerned. The enormous number of divorces and separations which are constantly occurring within a few months after marriage demonstrate forcibly and practically that many of our marriages were in reality trial marriages, but one degree higher in a legal sense than common-law unions, in which there is occasionally found an idealism of love and a sense of responsibility.

Prostitutes and prostitution.—Careful research by accredited American investigators into the problem of prostitution in America has led to the following definite conclusions, which may be briefly summarized as follows: The laws in general throughout the United States which have been enacted to suppress prostitution are chiefly directed against the female. Granting that the women engaged in prostitution are vicious, fallen, unchaste, and dangerous to the communities in which they live, it is a notorious fact that it is the male who seeks out the fallen woman in 90 cases out of 100, and that no less than 50 per cent of the men patronizing prostitutes are married men. Directing all the legal energies toward the woman prostitute and chasing her from pillar to post does not solve the problem of prostitution or venereal disease.

A study of the prostitute has shown, in most instances, that she is young in years; that she comes from a home broken by divorce, death, or poverty; that she is without home training, and with little or no education; that her mental endowment in most instances has been poor and that she belongs to the defective mental group; and that with these serious handicaps she has struggled along in bad environment, with evil associates, and with physical poor health. In the last analysis she has been shown to be a person of defective and sub-normal mental make-up, unable to battle in an adequate and normal manner with the problems of life.

Of the problem of prostitution, Ball says the following: "This is not alone a sociological problem but a psychological problem as well, and the studies of causes should begin in the cradle; the individual, male and female, should be studied, and those having special abilities should have them developed, those early manifesting bad sex habits should be guarded and if defective should become institutional cases.

"A plea, then, for closer studies of our school children and the establishment, by either public or private funds, of psychopathic laboratories for this work.

"Realizing that in our present state of educational and social development a demand exists for prostitution, and that so long as the demand lasts the supply will somehow be obtained, education and proper early segregation of socially unfit of both sexes will

be the ultimate solution, if it can be called such. At present a vicious circle exists.

"As an economic, sociologic, eugenic, and medical problem, syphilis is occupying considerable attention at the present time. The source from which most of the syphilis originates is the house of prostitution. It is a place where syphilis is concentrated.' It injures the germ plasm, and offspring are often defective, again supplying the individuals who in turn become mere carriers for the spirochaeta."

After considering these several angles of the venereal disease problems, two remedial and palliative measures will be briefly discussed concerning the relief of these conditions. These measures are chemical prophylaxis and sex education.

Chemical prophylaxis.—The subject of chemical prophylaxis has always been the ground for debate between two groups of physicians and social workers who have had the same goal idea of disease prevention in mind. It has been contended by pedantic and moralistic authorities that the beneficent value of venereal prophylaxis, resulting in a decreased rate of infection among the persons exposed, has been greatly offset by the supposititious number of chaste and virtuous individuals who are led to forsake the path of rectitude because of the immunity from infection which has been conferred by this same prophylaxis. This feeling is quite general among the lay organizations and women's clubs. They have believed that in many instances the prophylaxis of venereal disease is a method which condones and tolerates sexual promiscuity, for its use theoretically removes the fear of venereal disease.

This belief concerning chemical prophylaxis may be traced in general to summary factors involving two main issues: (1) That the individuals constituting the body social and politic are by nature and desire essentially erotic and promiscuous, and (2) that a repression or inhibition based entirely on fear is the main motivating factor in providing for the safe-keeping and sexually hygienic living of the Nation's youth and virility.

These factors lost their apparent validity under a close scrutiny. As to the status of mankind, there is, of course, no question as to the correctness of the opinion that all normal individuals during adolescence and adulthood, prior to the climacteric, have definitely developed sexual desires. If these desires can be sublimated to social or other nonsexual aims, even then it can not be deemed that they have been annihilated; but the presence and force of this sex instinct is not synonymous with outright eroticism or with a desire for sexual promiscuity. And the very proponents who believe that the removal of a fear repression will actuate humanity to an orgy of sensualism will be the first to declare the truth of the preceding statement. Although the sentiments and effects which have been built up

through custom and tradition can not under ordinary circumstances be considered as strong as the basic instincts, still they represent real and actual forces in the everyday life of the individual. The sexual morals of the community play a great part in the determination of the sexual life of the average individual.

The validity of a repression, based on fear, loses its chief value when it is realized that the individuals who could be best motivated by fear are, paradoxically, the very ones who are least likely to be influenced by it. The postulation of a repression of a sexual desire and life through fear of infection necessitates that the individual in question be of normal or superior intelligence, that he has taken the time to consider the proposition carefully, that he realizes the danger of infection from promiscuous intercourse and builds up an effective defense mechanism, and that he possesses sufficient will power and determination to resist temptation, no matter how strong it may be.

Such an individual, although the fear of infection may weight his decision, will be *pari passu* of such intelligence that he will have had ample opportunity to have built up a defense mechanism against promiscuity on some more rational or altruistic basis.

Or, granting that he has sufficient intelligence to follow the devious windings of the hypothetical suppositions involved, he may decide in favor of promiscuity because of other equally valid, to him, and equally reasonable bases. Thus, the intelligent individual is not affected by the availability of venereal prophylaxis to the extent that might be thought probable.

Taking the next case of the nonintelligent individual, the case is even more striking. He has not the mentality sufficient to realize adequately the dangers involved, is apt to consider infection no worse than a "bad cold," and with his lowered mentality, his emotional sphere is incapable of being approached on a really rational level. As is common with the mentally retarded, the will power and determination can not be expected to be strong, and he will either succumb to temptation or allow himself to be overruled by cajolery. It is probable that a highly organized and complex system of society tends to develop prostitution to a greater degree than that in which it occurs in primitive society. Although prostitution is mentioned by the oldest records, a study of modern conditions strongly indicates that the matter can be much more effectually regulated by local taboo in a small tribe or clan than by federal legislation in a large nation.

On the part of the male, civilization has made it necessary that he postpone marriage several years beyond adolescence, and many naturally turn to prostitution to solace these waiting years. With the female sex, the supply has been made to fit the demand, and the matter of payment, both specie and indirect, has played no small part.

Proper effective prophylaxis against venereal disease should be made readily available to all who are exposed to possible infection. Syphilis and gonorrhea are morbid cancers attacking the social fabric, and we are justified in using chemical prophylaxis as one of the methods in preventing venereal disease.

The proponents of chemical prophylaxis hold that ideals must never be lost in meeting the issues of the venereal problem. Yet they are always fully cognizant of the fact that they are not chasing moonbeams, but are dealing with actual diseased conditions. They argue that history has demonstrated through all ages that sexual promiscuity has existed and will continue to exist in many quarters, no matter what ideals are entertained. The proponents of chemical prophylaxis refuse to take the ostrich method of dealing with the situation by denying the facts or "hiding their heads in the sand." The Bible remarks, "Offenses must come, but woe unto him by whom the offense comes."

During the late war, every possible safeguard was thrown about the soldiers, the perils of venereal diseases were shown in pictures and told in story, the red-light districts were broken up in the regions of the great army camps, and officers of the Public Health Service were on extra cantonment duty in a continual fight against vice. Yet, in spite of the sexual knowledge given and the idealism preached to the soldiers, and other safeguards used, thousands of men acquired venereal disease, the effects of which are still to reach generations yet unborn. This is not a unique example of the failure of idealism to prevent venereal exposure in many instances; that which is true of the soldier is likewise true of the civilian.

The medical officers preached continence to the soldiers, taught idealism, laid great emphasis on the fear element as the motive for restraining human conduct, but knowing that these methods would not be effective in thousands of instances, they made it necessary for the exposed individual to take prophylactic treatment under penalty of court-martial. The Army did not condone immorality, but it was chiefly concerned with keeping the men fit for active military duty, and statistics show that thousands of cases of venereal disease were avoided by the method of enforced prophylaxis. And for this reason we are justified in teaching the use of chemical prophylaxis, since the males of the race should be kept fit for parenthood.

It must be borne in mind in discussing the value of chemical prophylaxis that this method is to be taught in conjunction with sexual idealism, that these two methods should not be opposed to one another, that we should use them conjointly, gaining simultaneously the value of both methods in dealing with various types of men.

Sex instruction.—The difficulties that have obstructed the path of sex instruction, have been for the most part the questions as to when it shall be first taught, and by whom the instruction shall be given. Outside of the confines of the medical profession, where the views of the sexual question have largely been colored by moralistic conceptions alone, there has been a wide difference of opinion.

The value of sex instruction was demonstrated in a very practical way during the late war. The percentage of venereal disease was reduced in many of the Army training camps and naval training centers by a very considerable proportion because of the patriotic response of the trainees to the Government's plea to keep "fit to fight."

In civil life the problem is more difficult to handle, yet the potentialities for good are greater.

The child becomes sex conscious in the majority of instances about 9 years of age, and at this age sex instruction should be begun, and such information should be given by the parents, the problem being treated in a general way, utilizing the biological history of plants and animals gradually correlating these facts with the history of human reproduction in a way that is not too literal or too personal. Parent-teacher associations are splendid organizations for the training of parents along the lines of methods of sex instruction, and the appropriate material for teaching can be secured by the interested parent, and the parent-teacher associations from the United States Public Health Service.

The teaching should be brought to the child, and the parent should not wait to begin instruction until after some vicious, distorted information has been imparted to the child from sources outside the home. The habits of cleanliness should be taught, for they do much to discourage the practice of self-abuse. As a child grows, his companionship, play, sports, and books should be carefully supervised. Unfortunately for the public good, the custom of chaperonage has lost its former vogue, resulting in a corresponding reduction in public morals. A sense of chivalry should be installed into the boy by teaching him a higher regard for his mother, sister, and all women in general. Physical labor in an appropriate degree about the home, some honest toil of a healthful sort which exercises the body and teaches thrift, along with the usual hardy sports of childhood and youth, are of tremendous value in sublimating and directing the sexual urge into constructive and useful channels of expression.

At the age of puberty, the physiology of menstruation should be made known to the girl, and the nature of seminal emissions should be imparted to the boy, lest he fall into the hands of quacks, who have heretofore worked enormous harm to the adolescent youth. Knowledge of venereal disease should be conveyed to the boy or girl

at this time, and the ravages of syphilis and gonorrhea should be made plain. If the parents are uncertain as to their information on this subject they will find it easily obtainable from the family physician, or some officer of the State or national health service.

The teaching of sex hygiene is not to be confined to the child or youth alone, if we are to stop the ravages of venereal disease. Courses of mental and social hygiene should be a part of the curriculum of every high school, college, and university, and the public lecture courses of our social institutions, such as the Y. M. C. A., the Y. W. C. A., Knights of Columbus, Women's Club, and similar organizations, should deal in a methodical manner with these subjects. The veil of prudery and false modesty must be torn from the subject of venereal disease. The white light of publicity and education must be turned on the hiding places of gonorrhea and syphilis by telling and retelling in plain, simple, unvarnished words the evils of prostitution until the public conscience is roused from its lethargy of indifference and unconcern.

Summary.—1. The sexual urge is a normal, physiological, and legitimate appetite, as is the desire for food, and should be viewed in this manner. Our present-day pleasures, manners, dress, theaters, books, and social customs stimulate and increase the normal sexual desires unduly.

2. Some modes of our prevailing methods of education give perverse ideas concerning sexual life.

3. The existing social and economic conditions prohibit early marriage, and this temporary prohibition of marriage increases prostitution and the spread of venereal disease.

4. The fear of venereal disease should be taught because there is a group within a social body which regulates its conduct very largely through the influence of fear. There is another group within the social body which regulates its conduct by a sexual idealism that it entertains, and not by fear, and therefore a positive idealism must be taught concerning sex matters. There is a third group which is not controlled by either fear or sex idealism, and responds to the sexual urge, irrespective of the consequences.

5. Sex hygiene should be taught to the child, the youth, and the adult. The subject of venereal disease should be brought again and again to the attention of the public until the public is so aroused in the matter that it takes steps to correct the evils resulting from prostitution. All methods of combating this social evil should be employed together, as no one particular method is effective for all classes or all conditions.

6. It is the function of the State and Nation to methodically combat all evils of prostitution through their organizations of public health and social agencies.

HEALTH OF THE NAVY.

Morbidity reports received in recent weeks indicate the general decline in sickness rates that is to be expected at this season of the year. The average admission rate for disease (all diseases) from the first of the year to date, for the entire Navy, is 675 per 1,000 per annum. Last year at the corresponding date the progressive average rate was only 580, but in 1921 at this time the rate was higher than this year—725 per 1,000.

Noninfectious diseases and conditions are partly responsible for keeping the rate above 600, but certain communicable diseases have also been more prevalent this spring. Influenza has been about twice as prevalent this year. Many cases of measles have occurred, due to the fact that this has been a measles year in many parts of the country, and recruiting has proceeded actively.

Acute bronchitis and acute tonsillitis, both of which infections are important causes of high morbidity throughout the year, have been more prevalent this year.

The accident rate since the first of the year has averaged 65 per 1,000 per annum, as against 52 for the corresponding period last year and 50 in 1921. This rate is higher than it should be and indicates the necessity for care throughout the service, because many of the accidents that occur are entirely preventable. An unusually high percentage of the accidents reported during May were fatal, due to an accident on board the U. S. S. *Hulbert* causing six deaths from fuel-oil burns, gasoline explosions on board the U. S. S. *Overton* and the U. S. S. *New York*, resulting in two deaths, and airplane accidents causing four deaths. The accidents on board the U. S. S. *New York* and the U. S. S. *Overton* were similar—gasoline was being used to clean machinery.

The following table shows annual admission rates per 1,000 per annum for certain communicable diseases, entire Navy, for the month of May, 1923, in comparison with median rates for the same month, 1918 to 1922, inclusive:

	Median rate for May, 1918-1922, inclusive.	May, 1923.		Median rate for May, 1918-1922, inclusive.	May, 1923.
Cerebrospinal fever.....	0.05	0	Mumps.....	13.66	19.98
Diphtheria.....	1.17	.32	Pneumonia.....	4.75	4.73
German measles.....	.87	.11	Scarlet fever.....	1.33	1.58
Influenza.....	26.47	22.40	Smallpox.....	.08	.21
Malaria.....	12.89	9.25	Tuberculosis.....	3.83	3.79
Measles.....	3.06	6.84	Typhoid fever.....	.13	0

Influenza was distributed during the month principally among the forces afloat, and more cases occurred in the Pacific than in Atlantic waters. In all, 213 cases were reported. These figures are not high for this time of year and indicate satisfactory subsidence of earlier outbreaks. Only 88 cases of malaria were reported during the month of May; 49 among marines at foreign shore stations, 23 cases at naval stations in the United States, and 16 in the fleet. Two cases of smallpox were reported for the same period, one from the receiving barracks at Hampton Roads, Va., and one from the U. S. S. *Goff*, Constantinople, Turkey. One case of typhus fever was reported from the U. S. S. *Bainbridge*, Beirut, Syria.

General admission rates at the four training stations have diminished somewhat in recent weeks, but are still high enough to affect the morbidity rate for the entire service. There were comparatively few admissions for communicable diseases at the training stations during the month. A few scattered cases of measles are still being reported from the naval training stations at Hampton Roads and San Francisco.

The average general morbidity rate for the scouting fleet was 698 per 1,000 per annum, and for the battle fleet 436 per 1,000. The incidence of measles and mumps in the fleet resulting from the prevalence of these diseases at the training station, Hampton Roads, Va., and the training station, San Francisco, Calif., during March and April appears to be diminishing.

IMPROVEMENT IN THE QUALITY OF RECRUITS.

The Bureau of Navigation News Bulletin No. 26, of June 5, 1923, contains a note relative to the fine appearance and better qualifications of a comparatively large draft of men recently sent to the U. S. S. *Wyoming* from the United States naval training station, Hampton Roads, Va. The commanding officer of the *Wyoming* reported that the men were in every way a credit to the station, presenting an exceptionally fine appearance. They were older than the usual run of such drafts and showed that they had been carefully instructed and drilled.

The selection of suitable recruits possessing satisfactory physical and mental qualifications and the proper seasoning and training of those men, old enough not to be unduly susceptible to the common infections and communicable diseases, constitutes one of the most important factors in keeping sickness rates and accident rates low in the fleet.

During the past three years much avoidable sickness, involving in the aggregate a large number of sick days, has been traceable

directly to more or less unsuitable recruit material, boys who found it difficult or impossible to adapt themselves to ship life and the ordinary essential service requirements without getting on the sick list several times during the first few months of service on board ship because of one preventable disability or another incident to the period of conflict and maladjustment to the new environment—minor, sometimes serious accidents, tonsillitis, too frequent and avoidable colds, sick days resulting from physical defects existing prior to enlistment, folliculitis and infectious or parasitic skin diseases due to lack of knowledge and ability to take care of themselves to the best advantage under the conditions of overcrowding on board ship (a serious thing in itself from the standpoint of health hazards), and finally, nostalgia and other emotional disorders involving neurosis, arising from mental conflict caused by inability to compete successfully with other members of their respective divisions in work and drill and in taking care of themselves and their effects.

The Navy attempts to teach and hold its men to good habits of personal hygiene, but it is highly desirable that the human material to start with should be the best obtainable if a satisfactory average of proficiency and a maximum number of days of actual service per man are to be secured.

**READoption OF DISCIPLINARY MEASURES IN THE PREVENTION OF
VENEREAL DISEASES IN THE UNITED STATES ASIATIC FLEET.**

In the Asiatic Fleet it has seemed desirable not to trust entirely to the assumption that men who have exposed themselves to venereal infection will make early, proper, and thorough use of prophylactic tubes, but to issue tubes and also revert to the system of requiring men to report exposures when they occur and to submit to disinfection upon return to the ship whether or not prophylaxis was used ashore.

The following fleet circular indicates the increase in venereal disease which has occurred during the past two years and outlines the measures recently adopted:

Fleet Circular No. 39-23.

75-tl. 231-9-23.

UNITED STATES ASIATIC FLEET,

U. S. S. "HUBON," FLAGSHIP,

Shanghai, China, May 4, 1923.

Subject: Venereal disease, prevention of.

1. The commander in chief desires to invite attention to the conditions regarding venereal disease as shown by the records of the last four years:

Year.	Per cent of total admissions.	Annual rate per 1,000.
1919.....	26.49	187.57
1920.....	37.88	295.256
1921.....	46.01	314.195
1922.....	44.06	368.916

2. In analyzing the reports from the different ships and stations it is noted that percentages vary from 20 to 89 per cent of the total admissions for diseases. This shows that on some ships the men have taken proper precautions, whereas on others there is evidence of lack of attention in the administration of the proper measures. The principle of prophylaxis has been proven beyond a doubt. The trouble is apparently due to the failure of the men to use it, or that they use it improperly. Immediate steps must be taken to reduce the present high rate of venereal disease which is so injurious to the efficiency of the personnel and to their future health. It will be noted that the annual rate has almost doubled in four years.

3. On receipt of this letter medical officers will institute a double prophylactic system; supplying tubes for use ashore as heretofore, and also institute prophylaxis on the return of the men to ships. The utmost care shall be used in seeing that all exposures receive prophylaxis as soon as possible. Men returning to the ships during the night should report "yes" or "no" and receive prophylaxis immediately. If necessary a Hospital Corps man should be on watch for the purpose. Routine monthly inspections for the discovery of venereal disease will be made by the medical officers, and in case of proven falsehood disciplinary action shall be taken. Reports shall be forwarded to the commander in chief monthly in addition to the reports required by the Bureau of Medicine and Surgery. The report required by article 1344, Fleet Regulations, 1923, will not be submitted in the future.

4. The hearty cooperation of all commanding and medical officers is expected in an effort to reduce the percentage of venereal disease on this station. Ships will be placed on a competitive basis regarding the percentage of occurrence of venereal disease.

G. S. LINCOLN,

Captain, United States Navy, Chief of Staff.

EXTERMINATION OF VERMIN ON BOARD THE U. S. S. "OKLAHOMA."

All large ships are liable to be troubled from time to time by infestations of rats, cockroaches, bed bugs, and other vermin, as well as flies. The following notice which is used on board the U. S. S. *Oklahoma*, printed in moderately large type and posted in various parts of the ship to assist in securing cooperation among the different divisions, is of interest. The employment of a small sanitary squad to attack vermin is probably the most effective method that can be used on board ship to destroy and limit the number of rats, bed bugs, and cockroaches. What is everybody's business is nobody's business.

NOTICE!

An effort is being made to exterminate rats, cockroaches, bed bugs, flies, and other vermin on the ship. The above pests seem to be increasing rapidly in number. A sanitary squad has been detailed to help kill and prevent the introduction of them aboard, but in order to get results every man must feel it his duty to do a little helping himself and then *do it*.

Don't throw food of any sort, paper holders for ice cream, paste-board containers for pies and cakes, and other such "pest tempters" on the decks. Put them in garbage containers, keep lids on garbage, don't spit on the decks; you are only bringing filth into your home and disease upon yourself by doing so.

Swat every fly and insect with which you happen to come in contact. *Help out! Do your part!*

Make the ship a clean and healthy place to live in.

REPORT ON BATAVIA AND SOERABAJA, JAVA, AND MAKASSAR, CELEBES,
DUTCH EAST INDIES.

BATAVIA, JAVA.

The U. S. S. *Huron* was at anchor in the port of Batavia (Tandjong Priok) from the 8th to the 14th of March, 1923.

Batavia is situated on the northwest coast of Java in latitude 6° south and longitude 106° 49' east. Its population is approximately 200,000, of whom about 25,000 are Europeans, chiefly Dutch. There are about 40,000 Chinese, the remainder of the population being made up of natives of Java and other islands of the Dutch East Indies. The city proper is divided into the business section (old Batavia, or the lower city) and the residential section (Weltevreden, or the upper city). Practically all the Europeans reside in Weltevreden, while the natives and Chinese occupy the lower city, where are also located the large business houses, banks, and similar institutions.

Tandjong Priok, the port of Batavia, is located 6 miles from Weltevreden and is connected thereto, as also to old Batavia, by railroad and a very good automobile road. Tandjong Priok, Batavia, and Weltevreden are all located on a flat plain but little above the sea level. The Tjiliwoeng River flows through both sections of the city and there are numerous canals, used for transportation and irrigation, branching off in all directions from the river. Much of the land about Tandjong Priok and the lower city is swampy, while in the vicinity of Weltevreden drainage has cleared the swamps to a great extent.

Mosquitoes are very numerous, both Culicine and Anopheline being present, consequently there is much malaria and dengue. At the time of the U. S. S. *Huron's* visit no epidemic was prevailing in Batavia,

but typhoid fever was present to some extent. Tuberculosis, syphilis (with all its late manifestations), beriberi, and yaws are very common among the natives. A prominent medical man in Batavia estimates the number of cases of yaws in Java at 10,000,000, and states that it is impossible to conduct an intensive campaign for its eradication because of the enormous expense involved. There are approximately 50,000 lepers on the island, and attempts at their segregation are being made.

Houses of prostitution are licensed and their inmates are subjected to frequent medical inspection. In addition, there are many clandestine prostitutes, and venereal disease is extremely prevalent.

Batavia and its environs are very hot, the average annual temperature being about 80° F. There are wet and dry seasons, but even during the dry season rains are frequent. About the only difference in the amount of rainfall in the two seasons is that in the rainy season it rains all afternoon every day, while in the dry season it rains only for a part of every afternoon. The rainy season comprises the months of December, January, and February. During this time the variation in temperature between night and day is less than 10° F., while during the dry season—June, July, and August—the daily variation is about 12° F.

The direction from which the wind blows in Batavia varies with the season. From April to August the wind is almost constantly strong from the south. During September and October the winds are also from the south but decrease greatly in velocity. In November the winds are variable, while in December, January, and February the winds are strong from the north. March is another month of variable winds.

Batavia has a modern water supply, the water being brought down from the mountains to the south. It is of recent construction, however, and the Europeans still boil all water used for drinking purposes. Sewage flows into the river and canals, and, as the river and canals are used by the natives for bathing places, as laundries, and as latrines, as well as for their supply of drinking water, skin and intestinal diseases are very common among them. Also the use of such streams by the natives for laundry purposes renders it unsafe to send clothes ashore to be washed. There are, however, several modern sanitary steam laundries in Batavia.

Owing to the dense population of Java and the insanitary habits of the natives, safe camping sites in the vicinity of Batavia are rare. Open areas in Weltevreden (Koningsplein and the Waterlooplein) could be used with comparative safety.

There are several large and first-class hotels in Batavia, where the food is good and well served. These hotels have all modern conveniences, and are clean and sanitary; also there are numerous sanitary restaurants.

Medical and surgical supplies are available in any quantity. There are numerous drug stores and surgical-instrument houses in Batavia. Java exports enormous quantities of quinine at present and the industry is increasing rapidly.

Batavia is well supplied with hospitals, some of which are modern in every respect. The largest and most up-to-date hospital is the Government civil hospital, a magnificent plant built on the pavilion plan and accommodating 1,000 patients normally. It is capable of expansion to 3,000 beds without difficulty. All of the buildings are of concrete. Most of them are one story in height and all are open to the air on four sides. The buildings are connected by covered, tile-paved corridors, the main corridor being approximately 1 kilometer in length. All buildings are thoroughly screened and immaculately clean. In the wards for contagious diseases modern apparatus for disinfection of excreta are installed. The superintendent and the heads of departments are Dutch. On the staff are representatives of almost all European nations. The nursing staff consists of Dutch nursing sisters, one for each unit, and of Javanese attendants, both male and female, under instruction in the training school. There is one attendant for every three patients. The hospital is supported by the Dutch Government and no charge is made for patients, with the exception of a few foreigners, usually seamen, who occupy beds in small two and three bed wards. These pay about 40 cents a day. Connected with the hospital is a medical school called Stovia, where there are about 500 Javanese students of all grades working for the degree of Indian arts. Both men and women are admitted to the school, and upon graduation are entitled to practice medicine anywhere in the Dutch East Indies. Many of the graduates go to Holland for further study and return to the island thoroughly equipped to practice medicine. The medical school is modern in all respects, has well-equipped laboratories, and an abundance of anatomical material.

In addition to the civil hospital there is a large military hospital in Weltevreden conducted by medical officers of the Dutch Army. It is not so modern as the civil hospital, but is well equipped and clean. Sailors from foreign men-of-war may be treated there. Also there are numerous small private hospitals, all with modern operating facilities.

Most of the buildings in Weltevreden are of concrete with tile or hardwood floors and are built so as to have as large a circulation of air as possible. Many of them could be readily converted into emergency hospitals, especially the Harmony and Concordia Clubs.

Vaccination against smallpox is compulsory in the Dutch East Indies, but, of course, many natives avoid it. Consequently smallpox is endemic at all times, and small epidemics are frequent. Inoculations against typhoid fever and cholera are given free of charge, but are not compulsory. Few of the natives have so far availed themselves of this privilege.

Quarantine for merchant ships is rigidly enforced at Tendjong Priok, but at the time of the U. S. S. *Huron's* visit no health officer came on board nor did anyone call for the bill of health.

SOERABAJA, JAVA, AND MAKASSAR, CELEBES, DUTCH EAST INDIES.

The U. S. S. *Huron* was at anchor off Soerabaja, Java, from March 16 to March 18, 1923, and at Makassar, Celebes, March 20, 1923. At neither place was sufficient time spent on shore to allow much information as to health conditions to be gathered. Both places are situated on very low ground and are surrounded by swamps and rice paddies. Consequently mosquitoes and malaria and dengue abound. Soerabaja, situated in latitude $7^{\circ} 14'$ south and longitude $112^{\circ} 44'$ east, is a city of about 150,000 inhabitants, with modern lighting, water, and sewage systems. The water, however, is not fit for drinking purposes without being boiled. All sorts of tropical diseases are prevalent, although at the time of the U. S. S. *Huron's* visit no epidemic was prevailing. There is a large military hospital which will care for sailors from foreign warships.

Makassar, Celebes, is situated in latitude $5^{\circ} 8'$ south and longitude $119^{\circ} 24'$ east. It has about 40,000 inhabitants, most of whom are natives and Chinese. There are very few Europeans and only one American. Makassar has open sewers and no adequate water supply. The usual tropical diseases are common. The only hospital is the army hospital, where civilians are treated and where foreign sailors are also admitted.

The average temperature of Makassar is somewhat lower than that of the coast cities of Java, and the night and day variation is also greater. The same conditions of rainfall and winds prevail as in Java.

INSTRUCTIONS TO MEDICAL OFFICERS.

Circular letter.

WRJ-ML:125884(23)

Serial No. 261-1923.

DEPARTMENT OF THE NAVY.

BUREAU OF MEDICINE AND SURGERY.

Washington, D. C., May 7, 1923.

To: All medical officers, pharmacists, and Hospital Corps men on independent duty.

Via: Official channels.

Subject: Accounting system for ships and stations.

Inclosure: Outline of system.

1. Beginning July 1, 1923, there will be placed in operation at all stations and on board all ships where any Medical Department property is in use, the system of accounting for Medical Department property and expenditure of supplies outlined on inclosure.

2. The system has been made as simple as will secure results. With proper supervision by the medical officer or pharmacist, it will require little more than accurate and painstaking work.

3. In order to economize, that is, to practice economies that are of definite value, it must be known just what is being done at the present time, how it is being done, how it compares with other ships or stations, and the results obtained. If this is not known, any effort to economize is not based on sufficient knowledge to secure results.

4. The reports from ships and stations at the present time are based entirely on cash expenditures; that is, the amount drawn from the medical supply depots, the supply department, or paid on public bills, and, therefore, represent simply bills paid in the year. No allowance can be made for differences in the amount of stores on hand, additional equipment, or other items that should not be charged to current expenses.

5. The system provides means for reporting *actual* receipts and *actual* expenditures over a certain period of time. It will be noted that the actual receipts bear no relation to the amount charged to current expenditures, but are carried as nonexpendable and expendable supplies on hand until actually expended. Reports prepared on this basis will inform the bureau as to the actual cost of maintenance for a given period of time; also as to the value of supplies remaining on hand.

6. The system outlined on inclosure does not replace the present system of allotments and reports of expenditure as these reports are necessary for the administration of current appropriations.

7. Requests for a small initial supply of the new forms, "Report of Medical Department receipts and expenditures" and "Issue voucher," will be made on the naval medical supply depot, Brooklyn, N. Y. It will be noted that destroyers and other small craft, recruiting stations, and other very small stations will not be required to use the "Issue voucher." Destroyers and small craft will not be required to submit individual reports, as such reports will be submitted by the tender.

E. R. STITT.

ACCOUNTING SYSTEM FOR THE MEDICAL DEPARTMENT OF SHIPS AND STATIONS, IN
EFFECT JULY 1, 1923.

1. The present system of allotments and reports of expenditures required by section 2 of chapter 20 of the Manual of the Medical Department will continue in force, and the system described herein will be in addition thereto.

2. Stock cards for both nonexpendable and expendable property will be brought up to date by an actual inventory. All equipment not on charge or on charge without price will be appraised at its replacement value and accounted for. If for any reason it is impossible to ascertain the value of any item, it is directed that a list of such items, with blank space for price, be forwarded to the bureau, where the value will be entered.

3. It must be remembered that many items used by the medical department of ships and stations are not the property of the Medical Department. On board ships such items as typewriters, sterilizers (except dental electric), incubators, Stoke's splint stretchers, mattresses, pillows, mattress covers, pillow covers, etc., usually are not Medical Department property, but are under the cognizance of other bureaus. Probably the best guide for determining whether or not property used by the Medical Department is Medical Department property is the Supply Table. As a rule, articles not listed on the Supply Table will not be taken up as Medical Department property, except where additional items, such as X-ray equipment, cases of trial-test lenses, etc., are issued by the medical supply depot. No definite rule can be given for determining the status of property in use at navy yards and stations, but generally all property other than buildings and appurtenances should be taken up as Medical Department property. (See paragraphs 3009 and 3010, Manual of the Medical Department.) In preparing inventory cards care will be exercised in order that no property is included except that belonging to the Medical Department. It is very important that the medical officer or pharmacist personally supervise the preparation of this inventory, in order that the reports submitted to the bureau will show the cost value of both nonexpendable and expendable property on hand.

4. The inventory prepared as of July 1, 1923, will show the actual amount and value of nonexpendable property and the value of expendable property by classes. Should the actual inventory not agree with the present stock cards a survey will be held and submitted, with the annual inventory, as a voucher to show why items have been expended. *Returns will show the actual number and value of nonexpendable items and value only of expendable items on hand. When items are missing they will be expended from the books and will not be included in returns.* (See Survey of missing articles.)

5. The senior medical officer will be held to a strict accountability for medical stores placed in his charge, but for the purpose of inventory he may require a junior medical officer (or pharmacist, see paragraph 6) to personally supervise the taking of the inventory and sign the certificate on the "Report of Medical Department receipts and expenditures." If the certificate is signed by another than the senior medical officer the senior medical officer will "approve" the report before submission to the bureau.

6. On board ships or on stations to which a chief pharmacist or pharmacist is attached he will be detailed as property and accounting officer in addition to such other duties as it may be desirable that he should perform to fit the requirements of the particular ship or station. The pharmacist so detailed shall be accountable to the senior medical officer for all equipment and stores in his charge, exercising personal and careful supervision over their condition and the economical expenditure thereof, reporting any deficiencies to the senior

medical officer.. The pharmacist, so detailed, will sign the certificate on the "Report of Medical Department receipts and expenditures," which will be approved by the senior medical officer before submission to the bureau.

7. "When stores and supplies are transferred from the charge of one medical officer to another, triplicate receipts must be passed.

"Whenever a medical officer is relieved from duty, he shall transfer to his successor all public property in his charge.

"When a Hospital Corps man has been placed in charge of property of the Medical Department, on his relief from duty he shall transfer to his successor all public property in his charge." (Art. 1171, N. R.)

8. Until the issue of the new front sheets, Form D, a notation similar to the following example will be made on the face thereof when a medical officer, or Hospital Corps man, transfers public property to his successor:

Nonexpendable property-----	\$10,000.00
Expendable property-----	15,000.00
	<hr/>
Value of property received for-----	\$25,000.00

9. New Form Da will be issued prior to the 1st of July and will be used in submitting the yearly inventory of property. This form has been changed to include the value of property in addition to number of items. In addition to listing nonexpendable property, expendable property will be listed by classes, as outlined in Supply Table, with money value only. Example:

Expendable supplies.

Medicines-----	\$5,000.00
Antiseptics and disinfectants-----	500.00
Tablets-----	800.00
Hospital stores-----	250.00
Etc.	
Etc.	
	<hr/>
Total-----	\$6,550.00

10. The bulk of all medical supplies will be kept in the medical storerooms and the quantity in the dispensary or sick bay kept as low as may be consistent with actual requirements.

11. Subject to the provisions of article 1145, Navy Regulations, the medical officer will place the storerooms in charge of a competent Hospital Corps man, who will receipt in writing for all stores placed in his charge and who will, on approved "Issue voucher," make such issues as are required in the operation of the Medical Department. Issues from storerooms will be made only by the Hospital Corps man having charge thereof.

12. An inventory of all stock in storerooms and nonexpendable property in use will be made at the close of each quarter and upon detachment of the senior medical officer. An inventory of supplies in storerooms will also be made upon the relief of the Hospital Corps man in charge.

13. In order that strict accountability may be established, no one other than the Hospital Corps man in charge of the storeroom shall be allowed access thereto except in cases of urgent necessity. When it is necessary to admit others to the storerooms for stowing, cleaning, etc., the Hospital Corps man in charge will always be present.

14. Expendable supplies will be issued only from the storerooms upon the approval of an "Issue voucher" by the senior medical officer, and in his ab-

sence by the next senior or by the pharmacist. The "Issue vouchers" are printed in triplicate. The primary reason for having these vouchers is to inform the senior medical officer as to the actual amount of stores brought from storerooms, and, secondly, to hold the storeroom keeper responsible for the amount of stores on charge.

15. The new form "Issue voucher" will be issued, when printed, to all Medical Department activities, except destroyers or other vessels that have such small quantities of stores as to make it impracticable to use this form. When stores are required from the storeroom the form will be prepared and when signed, the first will be delivered to the Hospital Corps man in charge of the storeroom and will be his authority for issue. When issues have been made and the voucher signed by person receiving the supplies the first will be returned to the office. The three vouchers will then be priced and the second will be retained by the medical officer for use as a check at the end of the quarter. The first will then be filed until the end of the month, when issues will be consolidated and entered on the stock cards. The third will remain in the bound pad as a further check on issues.

16. *Record book of receipts and expenditures.*—An ordinary blank book, foolscap size, as issued by the supply depot, will be ruled as noted on the attached sheet. In this book will be recorded the value of all receipts and expenditures as they occur and under the various headings indicated. At the end of the quarter the sum totals of the various headings will be carried to corresponding headings on the quarterly report.

17. *New unit price.*—When new supplies are received and there are like supplies in stock with different unit price, the value of the supplies will not be changed, but a new unit price will be obtained as shown in the following example: On June 30 there were on hand 10 bottles of acacia, unit price \$0.50 per bottle, making a total value of \$5; on July 1, 10 additional bottles were received from the supply depot with a unit price of \$1 per bottle, or a total value of \$10; we then have 20 bottles with a total value of \$15, making the new unit price \$0.75 per bottle.

18. *Report of Medical Department receipts and expenditures.*—(a) When submitted.

The report will be submitted not later than the 15th day of the month following the close of each quarter.

(b) By whom submitted.

The report will be submitted by every activity to which a representative of the Medical Department is attached. In the case of destroyers, submarines, and other small craft attached to destroyer or submarine bases or tenders, the report of the base or tender will include the report of the whole division. The combined report will show clearly just what activities are covered therein. The report of main recruiting stations will include the report of all substations.

(c) To whom submitted.

The Bureau of Medicine and Surgery.

(d) Number of copies submitted.

The ribbon copy only will be submitted.

(e) What receipts and expenditures shall be shown on the report?

All receipts of both nonexpendable and expendable supplies, when chargeable to appropriations under the cognizance of the Bureau of Medicine and Surgery, shall be shown. Supplies received as a charge to an appropriation under the cognizance of other bureaus will *not* be included.

(f) What appropriations are under the cognizance of the Bureau of Medicine and Surgery?

Appropriation: "Medical Department"; "Contingent, M. & S."; "Bringing home remains, etc."; "Care of hospital patients"; "Naval hospital fund."

(g) Are all the above appropriations available for expenditure on ships and stations?

The appropriations, "Medical Department"; "Contingent, M. & S."; and "Bringing home remains, etc.," are available for expenditure upon approved requisitions or allotment cards. The appropriation "Care of hospital patients" will be used only when specifically authorized by the bureau. The "Naval hospital fund" is never available for expenditure on ships and stations.

(h) What is the general scope of the appropriations available for expenditure on board ships and stations?

The appropriation "Medical Department" is available for the purchase of special diets for the sick and for medicines. "Contingent" is available for the purchase of special articles required for stations and for laundry on ships and stations. (See sec. 4 of chap. 1 of the Manual for the Medical Department.)

(i) When shall nonexpendable items be expended?

When surveyed as missing or upon approved survey as unfit for use.

(j) When shall expendable items be expended? •

Expendable items, when issued from the storeroom, will be shown as expended.

(k) Shall any information be placed on the reverse of the report of receipts and expenditures?

Information will be supplied on the reverse of the report showing the numbers and amounts of supply depot requisitions, public bills, stub requisitions, etc., that make up the amounts shown under original acquisitions. The number and amount of each survey will also be shown.

19. The headings appearing on the "Report of Medical Department receipts and expenditures" are explained as follows:

Nonexpendable supplies.—Nonexpendable supplies includes all equipment employed in the operation of the medical department of the ship or station except material used by the medical department that is furnished by other departments of the Navy. The supply table will be used as a guide in determining expendable and nonexpendable supplies. Items on hand not shown in the supply table will be classed as nonexpendable when by their nature they are similar to articles shown on the supply table as nonexpendable.

Balance from previous quarter.—The amount shown under this heading will be, for the report submitted as of July 1, 1923, the value of all nonexpendable supplies on hand as shown by actual inventory; for following quarters the amount will be that shown under "Balance to next quarter" for the preceding quarter.

Receipts.—This classification includes all the receipts of nonexpendable property from all sources.

Original acquisition.—Under this heading will be shown all original receipts of nonexpendable supplies (except Medical Department property received from other ships or stations), as under—

Medical supply depots: The value of all nonexpendable supplies received from medical supply depots will be shown under this heading.

Supply department: The value of all nonexpendable supplies received from the supply department of the ship or station chargeable to Medicine and Surgery appropriations will be shown under this heading.

Open purchase (public bills): The value of all nonexpendable supplies purchased in the open market and paid for on public bills charged against a

Bureau of Medicine and Surgery appropriation will be shown under this heading.

Transfer: The invoice value of all nonexpendable Medical Department property received by transfer from other ships or stations will be shown under this heading.

Total: The amount shown under this heading will be the total of the amount brought forward from the previous quarter, the value of the original acquisitions during the quarter, and of property received by transfer during the quarter.

Expenditures.—Includes the expenditure of nonexpendable property as under—

Final expenditures: When property has been actually expended from books by approved survey or surveyed as missing.

Transfer: Transfer of nonexpendable property to—

Other ships or stations: Receipted Form D showing invoice value will accompany quarterly reports when property is transferred to another ship or station.

Total expenditures: Value of property surveyed and transferred to other ships and stations.

Balance to next quarter.—The amount shown under this heading will be the difference between "Total receipts" and "Total expenditures." This amount will be shown on next quarterly report as "Balance from previous quarter."

Total.—The amount shown under this heading will be the sum of "Total expenditures" and "Balance to next quarter," and will balance with "Total receipts."

Expendable supplies.—Expendable supplies include all supplies consumed in the operation of the medical department of the ship or station that can not be charged to a nonexpendable heading. The Supply Table will be used as a guide for determining expendable supplies.

Balance from previous quarter—Receipts—Expenditures.—Same as under nonexpendable heading except that only expendable supplies will be included.

Expendable Form B supplies, medical.—Under this heading will be included all supplies received from the supply depot or like supplies purchased in open market or received by transfer from other ships or stations, and which have been expended for use by the Medical Department proper.

Expendable Form B supplies, dental.—Includes all supplies issued to the dental division. Includes medicines, dressings, etc., issued from Medical Department stock as well as strictly dental supplies.

Special diets.—The amount expended for special diets during the period covered by this report. This does not include special diets prepared from soups, etc., furnished by the medical supply depots.

Laundry.—The actual amount expended for laundry during the period covered by this report. Includes the cost of laundry work performed by ships laundry or by civilian laundry.

Ambulance service.—The cost of repairs, gasoline, oils, tires, etc., if paid for by Medical Department appropriations. When ambulances are maintained and operated by the navy yard or station garage there will be no charges to Medical Department appropriations.

Ice.—The cost of ice when paid for from Medical Department appropriations. Ice, except when used by the medical department of stations for the preservation of food or biologicals, will not be a charge to Medical Department appropriations. No ice furnished medical departments of ships will be made a charge to this heading.

Civil employees.—The amount actually paid all civil employees during the period covered by the report as under—

Clerical: The amount paid for clerical force.

Other: The amount paid employees other than clerical.

Miscellaneous.—This heading will include any expenditures not properly chargeable to any of the above headings. (See paragraphs 3005 and 3014, Manual of the Medical Department.)

Total expenditures.—A recapitulation of expenditures shown under both non-expendable and expendable headings.

Average complement.—The average Navy and Marine Corps complement for the period covered by the report.

Average cost per diem based on average complement.—Obtained by multiplying the average complement by the number of days in the quarter and dividing the "Actual expenditures chargeable to ship or station" by the sum so obtained.

Example:

Average complement, 1,000; number of days in quarter, 92; $1,000 \times 92 = 92,000$; actual expenditures, \$2,300; $\$2,300 \div 92,000 = \0.025 , the average cost per diem based on average complement.

Report of Medical Department receipts and expenditures, U. S. ———, for the quarter ended ———.

NONEXPENDABLE SUPPLIES.

Balance from previous quarter..... \$15,000. 00

Receipts:

Original acquisitions—

From medical supply depot..... \$1,000. 00

From supply department..... 100. 00

From open purchase (public bills)..... 25. 00

1,125. 00

By transfer—

From other ships or stations..... 100. 00

Total 16,225. 00

Expenditures:

Final expenditures—

By survey..... 225. 00

By transfer—

To other ships or stations..... 100. 00

Total expenditures..... 325. 00

Balance to next quarter..... 15,900. 00

Total 16,225. 00

EXPENDABLE SUPPLIES.

Balance from previous quarter..... \$22,000.00

Receipts:

Original acquisition—

From medical supply depot..... \$2,000.00
 From supply department..... 300.00
 From open purchase (public bills)..... 100.00
 From pay roll (civilian)..... 250.00
 ----- 2,650.00

By transfer—

From other ships or stations..... 150.00

Total 24,800.00

Expenditures:

Final expenditures—

Expendable Form B supplies, medical..... 850.00
 Expendable Form B supplies, dental..... 400.00
 Special diets 50.00
 Laundry 50.00
 Ambulance service..... 100.00
 Ice 25.00
 Civil employees—
 Clerical \$100.00
 Other than clerical..... 150.00
 250.00
 Care of the dead..... 25.00
 Miscellaneous 200.00
 ----- 1,950.00

By transfer—

To other ships or stations..... 250.00

Total expenditures..... 2,200.00

Balance to next quarter..... 22,600.00

Total 24,800.00

TOTAL EXPENDITURES.

Nonexpendable supplies..... 325.00

Less—

Transfers 100.00
 ----- \$225.00

Expendable supplies..... 2,200.00

Less—

Care of dead..... \$25.00
 Transfers..... 250.00
 ----- 275.00
 ----- 1,925.00

Actual expenditures chargeable to ship or station..... 2,150.00

Average complement..... 1,000

Average cost per diem based on average complement..... \$0.023

Number treatments civil employees..... 1,240

[Reverse of "Report of Medical Department receipts and expenditures."]

The following information will always be shown on the reverse of form in order that the amounts reported as receipts and expenditures may be checked with requisitions, public bills, and surveys on file in the bureau.

Receipts:

S. D. Req.—

No. 1..... \$850. 00
 No. 2..... 1, 300. 00
 No. 3..... 800. 00

E. I. S. 300-46..... 50. 00
 \$3, 000. 00

Stub requisition—

No. 1..... 250. 00
 No. 2..... 100. 00
 No. 3..... 50. 00

\$ 400. 00

O. P. Req.—

No. 1—Public bill No. 1..... 25. 00
 No. 2—Public bill No. 1..... 60. 00
 No. 3—Public bill No. 1..... 40. 00

\$ 125. 00

Pay roll—

July..... 83. 00
 August..... 85. 00
 September..... 82. 00

\$ 250. 00

From transfer—

Naval hospital, Norfolk, Va..... 200. 00
 N. O. B., Hampton Roads, Va..... 50. 00

\$ 250. 00

Expenditures:

By survey—

No. 1..... \$ 225. 00

By transfer—

U. S. S. *Florida*..... 100. 00
 U. S. S. *New York*..... 250. 00

\$ 350. 00

[Method for ruling "Record book of receipts and expenditures," par. 16.]

(Left hand page.)

RECEIPTS.

NONEXPENDABLE.

Date.	Medical supply depot.	Supply department.	Open purchase (public bill).	Other ships or stations.

SUPPLIES.

EXPENDITURES.

(Right hand page.)

Date.	Survey.	Other ships or stations.

*Amounts must correspond with those of face of report.

(Left hand page.)

EXPENDABLE.

RECEIPTS.

Date.	Medical supply depot.	Supply department.	Open purchase (P. B.)	Pay roll (civilian).	Other ship or stations.	

SUPPLIES.

(Right hand page.)

EXPENDITURES.

Date.	Form B, medical.	Form B, dental.	Special diets.	Laundry.	Ambulance upkeep.	Ice.	Civilian clerical.	Civilian others.	Other ships or stations.	Care of dead.	Miscellaneous.	

Circular letter.

WRJ-ML:132600-0(51).

Serial No. 262-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 7, 1923.

To: All medical officers, pharmacists, and Hospital Corps men on independent duty.

Via: Official channels.

Subject: Survey of Medical Department property.

Inclosure: Copy of instructions.

1. Beginning July 1, 1923, there will be placed in operation at all hospitals, stations, and on board ships where any Medical Department property is in use, the instructions outlined below.

E. R. STITT.

SURVEY OF MEDICAL DEPARTMENT PROPERTY.

Request for survey. Requests for survey of Medical Department property will be prepared in quintuplicate on M. & S. Form Ca. For each item there will be entered on these requests the item number, quantity, name of the article, date of receipt, purchase price, and a concise statement of the reasons for requesting its survey.

All sheets shall be typewritten whenever possible, and great care must be exercised to insure correctness of figures when quoting purchase price in order that such figures, when the survey has been approved, will agree with accounting figures sent to the bureau. If such care is not exercised, the accounting books will lose their balance and difficulties will be encountered.

When nonexpendable and expendable supplies are damaged by fire or other unusual occurrence a separate request for survey will be prepared covering only the articles so damaged.

Requests for survey may be made at any time that may be necessary but as a rule not less frequent than every six months and before the commanding officer of a naval hospital or the medical officer of a ship or station is detached. When articles are lost or missing, a request for survey will be immediately prepared and forwarded.

Requests will be numbered consecutively, beginning a new series with each fiscal year.

"In case of loss or such damage as to unfit supplies for issue, or articles of equipage for further use, the officer in whose charge they are shall request a survey, for the purpose of establishing and reporting the facts. If lost, the articles shall be expended from the books, but the accountability of the officer responsible for the loss shall not thereby be diminished, and the boards of survey shall ascertain and report thereon, but if they are so damaged as to be unfit for further Government use in their original capacity, and are to be turned into store, they shall remain on the books until they can be turned in, when they shall be invoiced at their appraised value to a supply officer on shore." (N. R. 1389.)

Articles will not be surveyed except when absolutely *unfit for any use* by the Medical Department, or when in excess or to be turned in for repairs. In other words, articles unfit for use in original capacity will not be surveyed if they can be used for another purpose.

Survey report. The board of survey appointed will personally see the articles listed on the request for survey, except when listed as lost, and will see that the number of articles corresponds with the amounts shown on the request for survey. Articles will not be surveyed when only a piece is shown. For example: If only a small part of a sheet is shown, this will not be accepted as a sheet. It is necessary that the entire sheet or the major part of the sheet be presented to the survey board and the same principle will hold true regarding other items.

The report will be typewritten whenever possible. The report will always state the number and date of the request.

The board will render, in accordance with the provisions of article 1907, United States Navy Regulations, a full and exhaustive report relative to the loss or deficiency and shall fix definitely, when possible, the responsibility therefor. Each item shall be separately reported upon and the invoice price shall be stated. The report of the board will be rendered in quadruplicate to the officer ordering the board, via the officer requesting the survey, who, upon approval thereof, shall forward the original and two copies to the Bureau of Medicine and Surgery with notation by indorsement thereon, as to whether or not any disciplinary action has been taken by him, and return one copy to the officer requesting the survey, who will forward the copy with the monthly or quarterly returns as a voucher for the expenditure of the articles.

In addition to stating the item number, name of item, invoice price, appraised price, and report, the following recommendations may be made as the case requires:

"To naval medical supply depot."

"To Supply Department, 'For sale,' or 'For yard scrap heap.'"

"To destroy, of no value."

"To loss."

"To naval medical supply depot." Articles will be recommended to be turned in to the nearest naval medical supply depot when they are "in excess" or unfit for use in present condition, but capable of being repaired. Surgical instruments, platinum needles, X-ray tubes, etc., will always be turned into the supply depot.

"For sale." When a board of survey recommends an article "For sale," they will be guided as follows: Articles of any nature not warranting repairs, except as noted under "To naval medical supply depot," and which can be sold in piece shall be condemned "For sale" with an appraised value. When

report of survey includes recommendation "For sale," it shall be rendered in quintuplicate.

"For yard scrap heap." When a board of survey recommends an article to "Yard scrap heap," they will be guided as follows: Articles of metal unserviceable and not warranting repairs and which can not be sold in piece to advantage, shall be condemned to the "Yard scrap heap."

"To destroy, of no value." This recommendation will only be made when the article can not be disposed of under any of the above dispositions.

"To loss." The action of the board when this recommendation is made is fully explained in article 1389, Navy Regulations.

Should the board of survey find that any of the items listed in the request for survey can be economically repaired on the station, or are fit for use without repairs, the survey board will eliminate these items from the report of survey by indicating on the request for survey by writing thereon, "Retain" or "Repair."

It will not be necessary to survey articles that are to be repaired on the ship or station. A requisition, or a request for job order, if repairs are to be made by a navy yard, will be submitted to the bureau for approval.

Approved survey.—When a report of survey is returned approved, the commanding officer will appoint an officer to personally supervise the destruction of property that is approved "To destroy, of no value." The officer so appointed will certify on the file copy that he has personally supervised the destruction of the number of articles shown in the approved survey. The articles will be actually destroyed except in the case of sheets, towels, and other linen, that may be torn up and used for cleaning material. By having the sheets and other linen torn up in small pieces and not surveying anything but entire sheets or linen, surveyed material can not be resurveyed or returned for use. Actually destroying surveyed articles should not result in any loss to the Government, as only absolutely worthless articles should be surveyed.

In case of articles recommended to be turned into the medical supply depot, Form D will be prepared and forwarded (in triplicate) to the medical supply depot, accompanied by a copy of the approved survey. One copy will be retained in the supply depot, the other two copies signed and returned, one copy to the hospital, ship, or station, and one copy to the bureau. The same will hold true of materials turned over to the supply department for sale.

When articles have been lost or are missing, a copy of the report of the board of survey will be forwarded with the "Report of receipts and expenditures" in the case of ships and stations, or with the monthly "Recapitulation" in the case of hospitals. This copy will act as a voucher for the expenditure of non-expendable articles. Returns will show the actual condition of property values and when articles are lost or missing they will be expended from the books by survey and not shown as being transferred to next quarter.

Replacements.—Any article under the approved survey authorized to be destroyed, for sale, or otherwise disposed of, may be replaced by appropriate requisition, provided it appears in the allowance list of the Supply Table. The requisition submitted pursuant to such survey shall, in all cases, bear the reference number of the survey and date of its approval. Articles not on the allowance list of the Supply Table, will be replaced only by a special requisition stating the necessity therefor.

Bureau of Navigation. Circular Letter No. 32-23.

N61-St: 57354-103.

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
Washington, D. C., May 12, 1923.

To: All ships and stations.

Subject: Advancement in rating.

Reference: (a) Bunav Circular Letter No. 12-22; (b) Bunav Manual, articles D-4100 to 4104 (Change, No. 2).

1. In reference (a) the bureau prescribed certain requirements necessary before men could be considered qualified for advancement in rating. Reference (b) superseded reference (a).

2. Before authorizing the advancement of a man to any petty officer rating, the bureau requires that he—

- (a) Be of good petty officer material;
- (b) Be recommended by his commanding officer;
- (c) Pass the required examination for advancement;
- (d) Serve one year in next lower rating with at least 3.5 in proficiency in rating, sobriety, and obedience; and
- (e) Be placed on the bureau's eligibility list in the rating for which qualified.

3. The bureau does not intend to relax in any particular the above requirements, but it does, however, desire to reduce the time elapsing between the date a man is fully qualified and the date of his advancement. To this end, the bureau authorizes commanding officers to examine and recommend men who are qualified in all respects, except in point of time, upon completion of nine months' satisfactory service. These men will be placed on the bureau's eligibility list as of date of completion of their year's service in the next lower rating. Should the bureau anticipate that the requirements of the service will exhaust the eligibility list by this date, it will issue authorization for advancement to be effective upon the completion of the year's service in the next lower rating.

4. Examining boards should be kept organized at all times, so that delays in forwarding reports may be reduced.

5. Should a petty officer, recommended to the bureau, fall below the required standards in marks or otherwise demonstrate his unfitness for advancement between the date of his recommendation and the bureau's authorization, the commanding officer shall so report, and the man's name will be removed from the eligibility list. Should the authorization for advancement have been received from the bureau, it shall be returned for cancellation.

6. Examination for lower ratings (other than petty officer) may be held in advance of completion of the year's service in time to advance men promptly upon that date, providing their records warrant.

7. In this connection, the attention of commanding officers is invited to the fact that they should give due consideration to the entries in the service records in column "Rating best qualified to fill."

THOMAS WASHINGTON.

Circular letter.
Serial No. 263-1923.

WWB EGM: P 21 42022.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 16, 1923.

To: All medical officers.

Subject: Examination of candidates for appointment to the warrant grade of pharmacist.

References: (a) Bunav. Circular Letter No. 31-23, N64-GWL, 6085-178, of 10 May, 1923; (b) articles D-5118, 5123 to 5130, inclusive, and 5700, Bureau of Navigation Manual.

1. In connection with the examination to be held the week beginning August 20, 1923, it is requested that all prospective candidates be informed of the need for additional officers of this grade and the bureau's desire that as many chief pharmacist's mates as possible submit requests for the examination. It is believed that if medical officers will properly present the advantages of appointment to this grade much desirable material may be persuaded to appear for the examination.

2. It is the intention of the bureau to have as members of the statutory examining board in Washington officers of the Medical and Hospital Corps who have general all-around professional attainments rather than officers who have specialized in certain subjects. The bureau further will direct that the questions prepared by the statutory board be broad in scope and such as will require a thorough, general, working familiarity rather than an intimate technical knowledge of such subjects as chemistry, pharmacy, materia medica, and toxicology, and will permit the candidates to demonstrate fully their knowledge of those administrative duties, especially with regard to accounting and property supervision, with which the majority of pharmacists and chief pharmacists to-day are concerned.

3. The ability and knowledge demonstrated in the practical and oral examinations before the supervisory board, the records of fitness and efficiency, and the recommendations forwarded in each case are to be accorded all possible consideration in determining a candidate's suitability for appointment.

E. R. STITT.

Circular letter.
Serial No. 264-1923.

WSD/JBC 124677-0(52)

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 31, 1923.

To: All naval hospitals (continental limits); post surgeon, marine barracks, Quantico, Va.; senior medical officer, naval submarine base, San Pedro, Calif.; commanding officer U. S. S. *Relief*; commanding officer U. S. S. *Mercy*.

Subject: Information for next of kin of Marine Corps dead.

References: (a) Paragraph 2952, Manual for the Medical Department, 1922; (b) paragraph 2965, Manual for the Medical Department, 1922.

Inclosure: N. M. C. 817 Q. M.

1. The appropriation for care of the dead of the Marine Corps provides for "funeral expenses of officers and enlisted men, and accepted applicants for enlistments, retired officer on active duty during the war, and retired enlisted men of the Marine Corps, including the transportation of bodies and their arms and wearing apparel from the place of demise to the homes of

the deceased in the United States." Under a decision of the Comptroller of the Treasury, the Marine Corps is authorized to pay not only the expenses of transportation of the body to the home of the deceased but also funeral expenses after arrival.

2. N. M. S. Hospital Form No. 61, "Information for next of kin," now in use for all Navy and Marine Corps dead, states that after the remains have been delivered to the next of kin at place designated by them the Navy Department is unable to defray any of the expenses which may be incurred in connection with funeral, interment, etc., there being specific law prohibiting such payment. This statement still applies to Navy dead but under the decision of the comptroller is not applicable to Marine Corps dead.

3. In view of the above, the Major General Commandant, Marine Corps, has requested that Marine Corps Form No. N. M. C. 817 Q. M., "Information for next of kin of Marine Corps dead," be substituted for the Navy form in all cases where the Navy forwards the remains of marines to their next of kin.

4. An initial supply of the Marine Corps form is inclosed with this letter. Additional copies may be obtained on letter request addressed to the Major General Commandant, Marine Corps.

E. R. STITT.

Circular letter.
Serial No. 265-1923.

WSG 126963 (34).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 8, 1923.

To: All naval hospitals (2 copies).

Subject: Naval Reserve Force; medical care and treatment.

References: (a) Department's third indorsement, No. 28550-1399: 4, April 25, 1923, to Navy recruiting station, Denver, Colo.; (b) department's fifth indorsement, No. 28550-1399: 5, April 25, 1923, to this bureau.

Inclosures: Copies of above-mentioned references.

1. The bureau is inclosing, in duplicate, copies of the above-mentioned opinions of the Judge Advocate General of the Navy; one copy will be passed around for the information of all members of the staff, including medical, dental, and warrant officers, nurses, and Hospital Corps men, and clerks engaged on office work; the other is for the permanent files of the hospital.

2. The approval of these opinions by the Secretary of the Navy gives them each the force of a decision.

E. R. STITT.

[Third indorsement.]

28550-1399: 4J.

DEPARTMENT OF THE NAVY,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, April 25, 1923.

From: The Judge Advocate General.

To: The officer in charge, United States Navy recruiting station, Denver, Colo.

Via: The Bureau of Navigation and the Bureau of Medicine and Surgery.

Subject: Naval Reserve Force, medical care and treatment for officers and enlisted men of.

Reference: Your letter to Bureau of Navigation, March 22, 1923.

1. In reference information is requested on the following questions:

(a) A man of the Naval Reserve Force class 1-B and class 2; also of the Fleet Naval Reserve class 1-C and 1-D, receiving medical attention in a private

hospital not under the jurisdiction of naval authorities. Would expenses incurred in this connection be defrayed by the Government?

(b) Is a man classified in (a) entitled to medical attention at a naval hospital as prescribed in article E-802, Bureau of Navigation Manual?

(c) In the case of an officer?

(d) In case of death of personnel classified in (a), is the allowance for transportation of remains to home or to the home of his relatives; also the burial expense, the same as prescribed for men of the regular Navy and on active duty?

(e) In the case of an officer?

(f) An officer on the retired list of the Navy is ordered to appear as a member of a Naval Retiring Board. Is this officer entitled to the full pay and allowances of his grade while on such duty, and is he entitled to Government transportation from his permanent residence to place where the Naval Retiring Board may convene? Is he considered to be in an active duty status during this period?

The foregoing questions are answered seriatim as follows:

(a) Members of the Naval Reserve Force class 1-B and class 2, receiving medical care and treatment in a private hospital not under the jurisdiction of naval authorities, are not entitled to have the expenses incurred in connection with said treatment defrayed by the Government except when in an active duty status. For example, if members of the Naval Reserve Force class 1-B and class 2, while in active service for training or in active service in any capacity other than at drills, require medical care and treatment which can not be furnished in kind by the Navy, the law authorizes its procurement from outside sources, the Government being responsible for the expense thereof, if properly authorized and incurred. (26 Comp. Dec. 408.) But members of the Naval Reserve Force class 1-B and class 2 are not entitled to medical care and treatment in a private hospital not under the jurisdiction of the naval authorities at the expense of the Government, when the occasion for said care and treatment has arisen while not in an active duty status. Members of the Fleet Naval Reserve class 1-C and 1-D not on active duty are not entitled to medical care and treatment in a private hospital not under the jurisdiction of the naval authorities at Government expense, but they are entitled to said care and treatment at Government expense when on active duty, if properly authorized and incurred.

(b) Members of the Naval Reserve Force class 1-B and class 2 on inactive duty are not entitled to medical attention at a naval hospital as prescribed in article E-802, Bureau of Navigation Manual, but members of the Fleet Naval Reserve class 1-C and 1-D on inactive duty are entitled to naval hospital treatment and to medical treatment whenever they reside in localities where medical officers of the Navy are on duty. Such treatment will be given under the same local rules as apply to the treatment of enlisted personnel of the Navy. (Bureau of Navigation Manual, art. E-802.)

(c) Officers in the Naval Reserve Force on active duty are entitled to the same medical care and treatment as officers of the regular Navy in a duty status. (Act of July 1, 1918, 40 Stat. 712.) Officers of the Naval Reserve Force on inactive duty are not entitled to medical care and treatment by medical officers of the Navy or in naval hospitals, but where officers of the Naval Reserve Force or other members of the Naval Reserve Force on active duty incur disabilities requiring medical care and treatment said medical care and treatment is generally continued after their enrollment in the Naval Reserve Force has expired.

(d) Members of the Naval Reserve Force on active duty are entitled to the same treatment relative to transportation of remains to home or to the home of relatives and burial expense as prescribed for personnel of the regular Navy on active duty. If not in "active service" at the time of death they are not entitled either to transportation of remains or burial at Government expense. However, where a member of the Naval Reserve Force dies at a naval hospital while not on active duty and without kin or friends to take charge of the remains, he may be interred at Government expense in the local burial grounds used by the Navy for such purpose.

(e) In the case of the death of an officer of the Naval Reserve Force on active duty the allowances for transportation of remains to home or to the home of his relatives and the allowance for burial are the same as prescribed for officers of the regular Navy of like grade and rank who die while in an active duty status. In the case of the death of an officer of the Naval Reserve Force while not on active duty, no allowance is authorized for transportation of remains or for burial expense. Where his death occurs at a naval hospital and there are no kin or friends to take charge of his remains, he may be interred at Government expense in the local burial grounds used by the Navy for that purpose.

(f) An officer of the retired list of the Navy ordered with his consent to duty as a member of a Naval Retiring Board is entitled to receive the active pay and allowances of his grade if not above that of lieutenant commander in the Navy, except where his retired pay exceeds the active duty pay and allowances for the grade of lieutenant commander for the same length of service, in which event he shall receive his retired pay while on such duty (act of August 29, 1916), and he is further entitled to transportation from his permanent residence at Government expense to the place where the retiring board is convened. Said officer is in an active duty status until he has been relieved from duty as a member of said Naval Retiring Board.

J. L. LATIMER.

Approved 25 April, 1923.

EDWIN DENBY,

Secretary of the Navy.

[Fifth indorsement.]

28550-1399: 5 J.

DEPARTMENT OF THE NAVY,

OFFICE OF THE JUDGE ADVOCATE GENERAL,

Washington, April 25, 1923.

From: The Judge Advocate General.

To: The Chief of the Bureau of Medicine and Surgery.

Subject: Naval reservists, medical treatment of.

1. Forwarded, all papers returned.
2. In attached papers a decision is requested as to whether medical and hospital expenses may be allowed members of the Naval Reserve Force while engaged on board naval reserve vessels in any capacity other than at drills; and if so, whether such expenses may be paid for the entire period they are under medical or hospital treatment, regardless of the expiration date of their period of duty.
3. Under the provisions of the act of July 1, 1918 (40 Stat. 712), members of the Naval Reserve Force when employed in active service, ashore or afloat,

under the Navy Department, "shall receive the same pay and allowances as received by officers and enlisted men of the regular Navy * * *."

4. The Comptroller of the Treasury held (28 Comp. Dec. 408) that enlisted men of the Navy are entitled to be furnished with medical care and treatment by the Government and when such care and treatment can not be furnished in kind by the Navy, the law authorizes its procurement from outside sources, the Government being responsible for the expense thereof, if properly authorized and incurred while the men are in a duty status.

5. Consideration of the provisions of the act of July 1, 1918, above quoted, discloses that members of the Naval Reserve Force when employed in active service are in the same status as officers and enlisted men of the regular Navy. It follows, therefore, that members of the Naval Reserve Force, when employed in active service, are entitled to be furnished with medical care and treatment by the Government and when such care and treatment can not be furnished in kind by the Navy its procurement is authorized from outside sources as in the case of members of the regular Navy in a duty status.

6. The act of August 29, 1916 (39 Stat. 587), provides that members of the Naval Reserve Force, upon application, may be assigned to "active service" for the purpose of instruction and training and requires a minimum of three months of such active service for training during each enrollment. The provisions of the act of August 29, 1918, above referred to, was amended by the act of July 1, 1918 (40 Stat. 710), by reducing the minimum active service for training required to two months during each term of enrollment and further provides that the "active service" thus required may be performed "in periods of not less than 15 days each."

7. The Comptroller of the Treasury held (27 Comp. Dec. 726) that the active service required for training as provided in the act of July 1, 1918, above referred to, entitles members of the Naval Reserve Force to receive the same allowances as officers and enlisted men of the regular Navy while in a duty status.

8. It is the opinion of this office, therefore, that members of the Naval Reserve Force on duty under competent orders on board naval reserve vessels in any capacity other than at drills, are in the "active service," and that while performing said service they are entitled to be furnished with medical care and treatment by the Government and that when such care and treatment can not be furnished in kind by the Navy the law authorizes its procurement from outside sources, the Government being responsible for the expense thereof if properly authorized and incurred.

9. It is the further opinion of this office that when it becomes necessary to incur expenses for medical and hospital services for members of the Naval Reserve Force procured from sources outside the Government where medical and hospital treatment can not be furnished in kind by the Navy, that the Government is responsible for the total expense of the medical treatment and hospital service thus rendered regardless of whether or not their period of service would have terminated except for the disability arising, prior to the termination of said treatment.

J. L. LATIMER.

Approved 25 April, 1923.

EDWIN DENBY,

Secretary of the Navy.

Circular letter.
Serial No. 266-1923.

WEE: SS 129733(61).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 9, 1923.

To: All naval hospitals.

Subject: Physical examination for purpose of reinstatement of Government insurance.

1. The following letter has been received from the Director of the United States Veterans' Bureau, under date of June 7, 1923:

"A number of cases have recently been reported to the Veterans' Bureau where former service men under treatment at Navy hospitals have been unable to secure a physical examination for purposes of reinstatement of Government insurance and for purposes of making claim for insurance disability benefits under Government insurance policies. The medical officers have given the reason that they had no authority under existing regulations to make such examinations.

"The request is therefore made, if not contrary to regulations, that medical officers of the United States Navy be authorized to make such examinations for ex-service men, without charge to the applicant, in cases where the applicant, either for reinstatement of insurance or for insurance disability benefits, is an actual inmate or patient in a Navy hospital."

2. It is directed that medical officers comply with the second paragraph of the director's letter and that a physical examination be given ex-service men who are actually inmates or patients in a naval hospital, for the purpose of reinstating Government insurance.

E. R. STITT.

WSG 125949.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 9, 1923.

To: All naval hospitals, and U. S. S. *Mercy* and U. S. S. *Relief*.

Subject: Ration notices; Forms S and T.

Reference: Circular Letter 125949(92)/113366, serial No. 244-1923, February 21, 1923.

1. By separate inclosure the bureau is forwarding one pad each of the new edition of Forms S and T, as per paragraph 7 of reference.

2. These new forms will be immediately placed in use, and older editions of the same will be scrapped.

3. Particular attention is invited to paragraphs 4, 5, and 6 of reference; to keep the records clear, these forms will *always* be used when an officer is admitted and discharged, and if quarters or subsistence, either or both, shall have been furnished, his pay account will be checked; where Ration Notice S shall have stated "and will not be either quartered or furnished subsistence," and it shall subsequently develop that quarters and subsistence, either or both, must be furnished by the hospital, the changed status of such officer will be taken care of by the proper entries on Form T.

F. L. PLEADWELL,
Acting.

By Executive order rates of rental and subsistence allowance remain unchanged for fiscal year 1924.

VITAL STATISTICS.

The Monthly Health Index, which is published on the 15th of each month, contains the statistical data for individual ships and shore stations. The statistics appearing in this Bulletin are summaries compiled from those published in the Monthly Health Index.

Annual rates, shown in the succeeding statistical table, are obtained as follows:

The total number of admissions to the sick list or the number of deaths reported during the period indicated is multiplied by $\frac{4}{3}$ or $\frac{5}{3}$ or 12, depending upon whether the period includes four or five weeks or a calendar month. The product is then multiplied by 1,000 and divided by the average complement.

E. R. STITT.

TABLE NO. 1.—Monthly report of morbidity in the United States Navy and Marine Corps for the month of May, 1923.

	Forces afloat.	Forces ashore.	Entire Navy.	Marine Corps.
Average strength.....	74,138	39,969	114,107	20,261
All causes:				
Number of admissions.....	2,618	3,196	5,814	118
Annual rate per 1,000.....	423.72	959.54	611.40	762.24
Disease only:				
Number of admissions.....	2,305	2,840	5,145	1,058
Annual rate per 1,000.....	373.06	852.66	541.05	678.83
Communicable disease, exclusive of venereal disease:				
Number of admissions.....	351	352	703	148
Annual rate per 1,000.....	56.80	75.76	73.93	94.95
Venereal disease:				
Number of admissions.....	718	365	1,083	220
Annual rate per 1,000.....	126.40	109.58	113.89	141.16
Injuries and poisons:				
Number of admissions.....	313	356	669	130
Annual rate per 1,000.....	50.66	106.88	70.35	83.41

TABLE NO. 2.—Number of admissions reported by form F cards for certain diseases for the month of May, 1923.

	Forces afloat, Navy and Marine Corps (strength, 74,138).		Forces ashore, Navy and Marine Corps (strength, 39,969).		Total (strength, 114,107).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases.....	2,305	373.06	2,840	852.66	5,145	541.05
Injuries and poisons.....	313	50.66	356	106.88	669	70.35
Total admissions.....	2,618	423.72	3,196	959.54	5,814	611.40
Class III:						
Appendicitis, acute.....	43	6.96	43	14.71	92	9.67
Autointoxication, intestinal.....	6	.97	6	1.80	12	1.26
Cholangitis, acute.....	17	2.75	12	3.60	29	3.05
Cholelithiasis.....	0	0.	1	.30	1	.11
Colitis, acute.....	1	.16	1	.30	2	.21
Constipation.....	11	1.78	23	6.91	34	3.58
Enteritis, acute.....	13	2.10	9	2.70	22	2.31
Gastritis, acute catarrhal.....	5	.81	9	2.70	14	1.47
Gastroenteritis.....	19	3.08	71	21.32	90	9.46
Hemorrhoids.....	27	4.37	24	7.21	51	5.36
Pharyngitis, acute.....	6	.97	37	11.11	43	4.52
Ulcer of duodenum.....	1	.16	1	.30	2	.21
Total.....	143	24.12	243	72.96	392	41.22
Class VII:						
Varicocele.....	5	.81	9	2.70	14	1.47

TABLE No. 2.—*Number of admissions reported by form F cards for certain diseases for the month of May, 1923—Continued.*

	Forces afloat, Navy and Marine Corps (strength, 74,138).		Forces ashore, Navy and Marine Corps (strength, 39,069).		Total (strength, 114,107).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Class VIII:						
Chicken pox.....	2	.32	6	1.80	8	.84
Diphtheria.....	0	0	3	.90	3	.32
German measles.....	0	0	1	.30	1	.11
Influenza.....	109	17.64	104	31.22	213	22.40
Measles.....	20	3.24	45	13.51	65	6.84
Mumps.....	168	27.19	22	6.81	190	19.98
Pneumonia, broncho.....	1	.16	26	7.81	27	2.84
Pneumonia, lobar.....	8	1.29	10	3.00	18	1.89
Scarlet fever.....	7	1.13	8	2.40	15	1.58
Smallpox.....	1	.16	1	.30	2	.21
Total deaths.....	316	51.14	226	37.83	542	57.00
Class IX:						
Dysentery, bacillary.....	1	.16	2	.60	3	.32
Dysentery, entamebic.....	0	0	1	.30	1	.11
Total.....	1	.16	3	.90	4	.43
Class X:						
Dengue.....	8	1.29	25	7.51	33	3.47
Malaria.....	16	2.59	72	21.62	88	9.25
Total.....	24	3.88	97	29.12	121	12.72
Class XI:						
Tuberculosis (all forms).....	10	1.62	26	7.81	36	3.79
Class XII:						
Chancroid.....	199	32.21	73	21.92	272	28.60
Gonococcus infection.....	469	74.45	131	39.33	601	72.67
Syphilis.....	59	9.55	71	21.32	129	12.62
Total.....						
Class XVIII:						
Bronchitis, acute.....	92	14.89	278	83.46	370	38.91
Laryngitis, acute.....	5	.81	8	2.41	13	1.37
Pleurisy, acute fibrinous.....	8	1.29	5	1.50	13	1.37
Rhinitis, acute.....	8	1.29	19	5.70	27	2.84
Tonsillitis, acute follicular.....	249	40.30	311	93.37	560	58.89
Total.....	362	58.59	621	186.44	983	103.37
Class XX:						
Hernia.....	25	4.05	24	7.21	49	5.15

TABLE No. 3.—*Summary of annual admission rates for venereal disease reported from ships for April and from various shore stations for the four-week period May 6 to June 2, 1923.*

	Annual rate per 1,000, April			Average rate since Jan. 1, 1923.		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All ships.....	0	160.66	1,639.02	25.48	143.36	1,882.35
Battleship and cruiser force—						
Scouting Fleet.....	46.15	134.36	568.05	60.59	143.12	425.27
Battle Fleet.....	17.56	85.63	159.86	58.84	92.37	286.49
Asiatic Fleet.....	183.67	183.67	183.67	184.93	597.01	832.03
Destroyer squadrons—						
Scouting Fleet.....	0	214.49	1,009.34	25.48	214.25	1,882.35
Battle Fleet.....	0	85.63	339.62	27.33	100.32	215.73
Asiatic Fleet.....	111.11	522.43	1,471.70	46.15	408.67	1,471.70
Miscellaneous—						
Scouting Fleet.....	0	217.40	1,032.26	25.97	173.51	458.60
Battle Fleet.....	0	179.60	1,090.91	36.36	144.96	360.00
Asiatic Fleet.....	0	579.92	1,639.02	67.70	587.90	1,639.02

TABLE No. 3.—*Summary of annual admission rates for venereal disease reported from ships for April, etc.—Continued.*

	Annual rate per 1,000, May 6 to June 2, 1923.			Average rate since Jan. 1, 1923.		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All naval districts in the United States....	0	63.23	244.60	9.85	68.28	181.87
First naval district.....	20.17	74.49	210.64	43.73	51.45	76.33
Third naval district.....	0	50.70	96.81	9.85	52.81	118.59
Fourth naval district.....	38.07	57.95	78.43	87.09	136.68	181.87
Fifth naval district.....	32.26	76.16	162.16	49.79	76.99	96.77
Sixth naval district.....	51.99	61.94	244.60	41.80	42.40	50.00
Seventh naval district.....	0	0	0	15.75	15.75	15.75
Eighth naval district.....	0	13.07	15.76	75.93	74.97	76.38
Ninth naval district.....	35.71	35.71	35.71	37.83	37.83	37.83
Eleventh naval district.....	0	27.08	42.50	22.00	65.56	132.00
Twelfth naval district.....	47.56	51.48	57.45	54.11	76.90	90.52
Thirteenth naval district.....	84.78	115.43	153.30	39.75	65.05	96.38

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE.

	Per cent, April.		Per cent since Jan. 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All ships.....	80.68	12.52	65.51	8.82
Battleship and cruiser force—				
Scouting Fleet.....	58.00	14.00	67.67	9.91
Battle Fleet.....	63.36	9.92	67.84	12.45
Asiatic Fleet.....	33.33	33.33	41.25	3.75
Destroyer squadron—				
Scouting Fleet.....	58.56	12.61	63.70	8.89
Battle Fleet.....	58.97	5.13	70.70	5.09
Asiatic Fleet.....	61.22	6.12	65.29	6.61
Miscellaneous—				
Scouting Fleet.....	61.90	7.14	61.93	6.71
Battle Fleet.....	60.00	7.14	63.84	8.79
Asiatic Fleet.....	38.46	7.69	53.92	4.90

	Per cent, May 6 to June 2, 1923.		Per cent since Jan. 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All naval districts in the United States.....	77.78	5.93	74.94	14.32
First naval district.....	76.19	4.76	81.71	4.88
Third naval district.....	77.78	0	73.58	13.21
Fourth naval district.....	16.67	0	74.68	6.33
Fifth naval district.....	79.66	8.47	68.52	16.67
Sixth naval district.....	77.78	0	67.56	18.92
Seventh naval district.....	0	0	100.00	0
Eighth naval district.....	100.00	0	83.33	6.67
Ninth naval district.....	50.00	50.00	83.33	16.67
Eleventh naval district.....	66.67	33.33	81.82	15.15
Twelfth naval district.....	87.50	0	81.95	12.81
Thirteenth naval district.....	100.00	0	88.46	11.54

TABLE NO. 4.—*Number of admissions reported by Form F cards and annual rates per 1,000, entire Navy, for the four-week period May 6 to June 2, 1923, inclusive.*

Class.	Navy (strength, 93,846).		Marine Corps (strength, 20,261).		Total (strength, 114,107).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases of blood.....	1	0.14	0	0	1	0.11
Diseases of circulatory system.....	33	4.57	9	5.77	42	4.78
Diseases of digestive system.....	409	56.65	158	101.38	567	64.59
Diseases of ductless glands and spleen.....	4	.55	1	.64	5	.57
Diseases of ear.....	79	10.94	12	7.70	91	10.37
Diseases of eye and adnexa.....	57	7.90	15	9.62	72	8.20
Diseases of genito-urinary system (non-venereal).....	122	16.90	31	19.89	153	17.43
Communicable diseases transmissible by oral and nasal discharges.....	355	50.56	63	40.42	428	48.76
Communicable diseases transmissible by intestinal discharges.....	1	.14	2	1.28	3	.34
Communicable diseases transmissible by insects and other arthropods.....	50	6.93	75	48.12	125	14.24
Tuberculosis (all forms).....	21	2.91	8	5.13	29	3.30
Venereal diseases.....	828	114.60	220	141.16	1,048	119.39
Other diseases of infective type.....	220	30.47	101	64.80	321	36.57
Diseases of lymphatic system.....	45	6.23	20	12.83	65	7.40
Diseases of mind.....	23	3.19	15	9.62	38	4.33
Diseases of motor system.....	67	9.28	20	12.83	87	9.91
Diseases of nervous system.....	27	3.74	8	5.13	35	3.99
Diseases of respiratory system.....	849	117.60	198	127.04	1,047	119.27
Diseases of skin, hair, and nails.....	58	8.03	43	27.59	101	11.51
Hernia.....	36	4.99	7	4.49	43	4.90
Miscellaneous diseases and conditions.....	124	17.18	28	17.97	152	17.32
Parasites (fungi and certain animal parasites).....	87	12.05	24	15.40	111	12.65
Tumors.....	6	.83	0	0	6	.68
Injuries.....	449	62.20	122	78.28	571	65.05
Poisons.....	27	3.74	8	5.13	35	3.99
Total.....	3,988	552.42	1,188	762.24	5,176	589.65

TABLE NO. 5.—*Deaths reported, entire Navy, for the four-week period May 6 to June 2, 1923, inclusive.*

Cause.	Navy (strength, 93,846).	Marine Corps (strength, 20,261).	Total (strength, 114,107).
Meningitis cerebrospinal.....	1	0	1
Pneumonia lobar.....	1	0	1
Tuberculosis (all forms).....	1	1	2
Malignant growths.....	1	0	1
Other diseases.....	5	0	5
Drowning.....	1	3	4
Injuries.....	14	0	14
Poisons.....	2	0	2
Total.....	26	4	30
Annual death rate per 1,000, all causes.....	3.60	2.57	3.42
Annual death rate per 1,000, disease only.....	1.25	.64	1.14

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VOL. XIX

NO. 2

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PLANNING AND PUBLICATIONS
CAPTAIN D. N. CARPENTER, MEDICAL CORPS, U. S. NAVY
IN CHARGE

EDITED BY
LIEUTENANT COMMANDER W. M. KERR, MEDICAL CORPS, U. S. NAVY

AUGUST, 1923
(MONTHLY)



Compiled and published under authority of Naval Appropriation Act
for 1923, approved July 1, 1922

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

Owing to the exhaustion of certain numbers of the BULLETIN and the frequent demands from libraries, etc., for copies to complete their files, the return of any of the following issues will be greatly appreciated:

Volume VII, No. 2, April, 1913.
Volume VIII, No. 1, January, 1914.
Volume VIII, No. 3, July, 1914.
Volume VIII, No. 4, October, 1914.
Volume X, No. 1, January, 1916.
Volume XI, No. 1, January, 1917.
Volume XI, No. 3, July, 1917.
Volume XI, No. 4, October, 1917.
Volume XII, No. 1, January, 1918.
Volume XII, No. 3, July, 1918.

SUBSCRIPTION PRICE OF THE BULLETIN.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Yearly subscription, beginning January 1, \$1.50; for foreign subscription add \$1.00 for postage.

Single numbers, domestic, 15 cents; foreign, 24 cents, which includes foreign postage.

Exchange of publications will be extended to medical and scientific organizations, societies, laboratories, and journals. Communications on this subject should be addressed to the Surgeon General, United States Navy, Washington, D. C.

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PREFACE.

The UNITED STATES NAVAL MEDICAL BULLETIN was first issued in April, 1907, as a means of supplying medical officers of the United States Navy with information regarding the advances which are continually being made in the medical sciences, and as a medium for the publication of accounts of special researches, observations, or experiences of individual medical officers.

It is the aim of the Bureau of Medicine and Surgery to furnish in each issue special articles relating to naval medicine, descriptions of suggested devices, clinical notes on interesting cases, abstracts of current medical literature of special professional interests to the naval medical officer, reports from various sources, historical essays, notes and comments on topics of medical interest, and reviews or notices of the latest published medical books.

The bureau extends an invitation to all medical officers to prepare and forward, with a view to publication, contributions on subjects of interest to naval medical officers.

In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will send a letter of commendation to authors of papers of conspicuous merit and will recommend that copies of such letters be made a part of the official record of the officers concerned.

The bureau does not necessarily undertake to indorse all views or opinions which may be expressed in the pages of this publication.

E. R. STITT,
Surgeon General United States Navy.

v

NOTICE TO SERVICE CONTRIBUTORS.

When contributions are typewritten, *double spacing* and wide margins are desirable. Fasteners which can not be removed without tearing the paper are an abomination. A large proportion of the articles submitted have an official form, such as letterheads, numbered paragraphs, and needless spacing between paragraphs, all of which require correction before going to press. The BULLETIN endeavors to follow a uniform style in headings and captions, and the editor can be spared much time and trouble and unnecessary errors can be obviated if authors will follow in the above particulars the practice of recent issues.

The greatest accuracy and fullness should be employed in all citations, as it has sometimes been necessary to decline articles otherwise desirable, because it was impossible for the editor to understand or verify references, quotations, etc. The frequency of gross errors in orthography in many contributions is conclusive evidence that authors often fail to read over their manuscripts after they have been typewritten.

Contributions must be received two months prior to the date of the issue for which they are intended.

The editor is not responsible for the safe return of manuscripts and pictures. All materials supplied for illustrations, if not original, should be accompanied by a reference to the source and a statement as to whether or not reproduction has been authorized.

Only the names of actual reviewers for a current number appear.

The BULLETIN intends to print *only original articles, translations, in whole or in part, reviews, and reports and notices of Government or departmental activities, official announcements, etc.* All original contributions are accepted on the assumption that they have not appeared previously and are not to be reprinted elsewhere without an understanding to that effect.

U. S. NAVAL MEDICAL BULLETIN

VOL. XIX.

AUGUST, 1923

No. 2

SPECIAL ARTICLES.

COMPRESSION FRACTURES OF THE LOWER END OF THE RADIUS.¹

By JAMES H. STEVENS, M. D., Boston, Mass.

The subject of Colles's fracture is a tremendously interesting one. The mechanism of its production is more than an interesting study of mechanics, because it has a direct bearing upon the treatment and upon the proper understanding of exactly what has happened, and if we have no clear conception of what has happened I doubt if we shall have any idea of what we have to accomplish in order to effect a restoration which shall, at least, approximate normal.

There are thousands of cases of Colles's fracture being treated every day in this country, and as many of these cases belong in the industrial compensation class it can readily be seen that the loss of productivity reaches into an economic loss that is enormous. Many of these cases when discharged from treatment present stiffening of the motions of the wrist which is premanent, especially in flexion, and many of them present a picture in which the deformity is of such a nature as to merit the word atrocious, and especially when such a result is obtained in a woman's wrist.

Our contentions concerning these fractures as usually treated are as follows:

First. In many of the cases the posteriorly dislocated inferior fragment of the radius is never reduced.

Second. Even when the major dislocation has been reduced, the fracture is of such a nature—a crush—that this reduction of fragment is only a partial reduction, and there is always a change, especially of the antero-posterior plane of the inferior radial articulation. The fracture is, as a rule, only half reduced.

Third. That whether reduced or not the subsequent treatment of these fractures has been such as to require many weeks or months for

¹ The *Annals of Surgery* for November, 1922, contains an article written by Dr. J. H. Stevens, with the title "Compression fractures of the lower end of the radius," in which is outlined a treatment for Colles's fracture quite at variance with the accepted method of treatment. Impressed by the arguments which the writer put forth in support of his views concerning Colles's fracture, some of the medical officers at the United States Naval Hospital, Annapolis, Md., used the method advocated by him and obtained better results than could be expected from the methods usually employed. As Doctor Stevens's method of handling these fractures might be of interest to the medical officers of the Navy, he was invited to contribute a paper on the subject to the BULLETIN.

the recovery of motion, and that nearly always there remains a permanent loss, small or great, especially in flexion. This is the result of immobilization.

Cases of Colles's fracture in the main are now treated by restriction in plaster or splints for from three to five weeks; then they are massaged, baked, and manipulated. Even at three weeks there is restriction both in flexion and extension, the full flexion of the wrist being oftentimes overlooked because of the compensating flexion of the fingers.

In youth or young adult life most of the cases work out after a time to a fairly successful result, but in older patients the results are generally bad.

There are certain fundamentals of mechanics regarding the breaking of any substance with which one should be familiar. The less the elasticity, the nearer the bending and the breaking moments are together. The bending and the breaking moment in an absolutely inelastic substance would be together, would be simultaneous. The shorter the substance, that is, if we consider an ordinary substance like a column or a strut or a lever, the less the elasticity, and hence the nearer these two moments are together. This has a bearing in certain fractures of bone.

When we break a substance there is an elastic limit encountered at a certain point beyond which the break occurs. This term in mechanics is being supplanted to a certain extent, but it is still employed in the literature and is so often used that it is sufficient for our purposes.

The elastic limit of a breaking substance is that point beyond which there is no comeback and a permanent set occurs to the material. In other words, the substance has been irretrievably injured.

There are several kinds of stresses or strains which cause fracture or breakage when applied beyond the elastic limit. These are:

Tension, which tends to lengthen the substance under consideration; compression, tending to shorten it; transverse breaking stress, tending to bend it; sheer, tending to cause one part to slide over the adjacent part; torsion, tending to twist it.

Tension, compression, and sheer are called simple stresses.

Transverse stress is a compound of tension and compression. Torsional stress is a compound of tension and sheer.

To these might be added tearing stress, which might be either tension or sheer, but in which the resistance of different portions are brought into play in detail or one after the other, instead of simultaneously as in simple stresses.

A sudden stress is more injurious than a steady or gradually applied stress.

A tension stress tends to cause rupture or separation of particles in the line of stress, but a compression stress may, depending on the material, cause it to separate into two or more wedge-shaped pieces, to bulge, to buckle, or bend, or, as in granite, to fly into pieces. Old bone will sometimes do this very thing.

If we take a material, wood for instance, and apply a transverse stress, we shall find that always will it break in tension; that is, the molecular structure of a fibrous material will always pull apart on the tension side first and there will be more or less long splintering.

In a crystalline substance the break will tend to be more transverse, and as it approaches the compression side there will be a tendency to a split out, a wedge, because a transverse stress is always a stress in tension on one side and compression on the other, and where compression and tension are equal, a break is always in tension.

Now, in order to break in compression, the compression must be greatly in excess of the tension and as this is impossible in a simple cross-breaking stress, it always breaks in tension.

A leverage fracture is always a transverse or cross-breaking stress with an element of sheer at the fulcrum.

Sheer is best illustrated by a scissors action, one or both substances being under compression, but it is an intensely localized compression or molecular compression, as it were, and there is the tendency of one portion to slide over the other.

Therefore it can be clearly seen that each particular stress has a tendency to cause an equally distinct type of break. Many times there is a combination of stresses and this must be borne in mind.

The structure broken also must be considered as having a bearing on the type of break and when we consider bone specifically, we find a vast amount of difference. Young bone and old bone are not of the same composition. Bone is a fibrous structure, containing a deposition of salts of various minerals: Calcium, potassium, iron, magnesium, and so forth. It is not a dry substance, so that it does not act the same always, depending on the difference of composition. Again, bone is hollow, and it is trabeculated, the interstices being filled with a substance of different specific gravity. There is very little bend to bone, and, in the terminology of the mechanical engineer, bone is cold short—that is, there is no diminution of structure when subjected to tensile stress in the pulling machine.

It breaks when its elastic limit has been exceeded, but there is no diminution of the area of its broken parts. Every substance that is cold short is more or less brittle. The best example of this is glass, and we do not think of glass as a particularly strong substance, but tested in the testing machine, as pure tension, one will be surprised at the tensile strength of glass.

Such a stress, however, must be uniform over the whole area, because any variant from this will bring a greater stress on some particular portion of the mass and as it is cold short, and therefore brittle, it is particularly susceptible to sheer or to impact. Comparatively small stresses will break it under these conditions, stresses which, under straight tension or static compression, it would have resisted.

All Colle's fractures, and they are all compression fractures, can be classified in three types as follows:

First. *Simple transverse fracture of the bone with little or no evidence of compression.*—These are more often the automobile fractures. The mechanics of the fracture are the same, but the force is not always great enough to badly damage the structure.

Second. *Fracture of the lower end of the radius with evidence of great compressive force.*—There is here actual loss of substance on the posterior surface of the bone, the so-called impaction. Flexion, cracks, or fissures may or may not exist on the opposite side. The planes of the articulation are always changed, much or little.

Third. *Fractures of the lower end of the radius with actual dislocation of the distal fragment backward and sometimes in abduction.*—There is impingement of the distal fragment on the posterior sharp surface of the proximal fragment. The same injury often-times breaks the styloid process of the ulna or even the ulnar shaft, but the ulnar break is always secondary to the main break and not a compression break.

The break of the ulnar styloid is simply a sheering fracture. All writers have contended that the ulna styloid is broken by the pull of the anterior annular ligament. The medical profession seem to be obsessed with the tremendous tensile strength of a ligament as against bone. The ulna styloid is really broken, as one may see by examining the articulated skeletal bones, as the result of a transverse cross-breaking strain or a sheer. The man falling goes forward on his face, and to prevent his face from striking he turns his body always away from the side injured. The hand is fixed on the ground and the radius is fixed firmly while the ulna as part of the whole arm rotates, bringing the base of the styloid of the ulna smartly against the posterior edge of the radio ulnar articulation and generally cracking it off at its base. The ulnar fracture higher up is a simple transverse tension break as the resultant of two forces, secondary to the main break.

Whether the ulnar styloid is broken or not is unimportant. If the ulna above has been broken, we have a different problem, but a different problem only as regards treatment.

Ninety-five per cent of these fractures will fall into the second and third types. Occasionally there is one which does not show the evi-

dence of compression to any great extent, and occasionally also there is the abduction type, due to sheer which does not show it. But nearly all of them will show the evidence of compression.

There is actual destruction of the cortical bone on the posterior side of the radius from compression; therefore, the fragment always tilts backward even where there is no dislocation. Where the force is great this inferior fragment dislocates backward and, depending on the position of the hand (sometimes outward), comes to rest tilted on the posterior edge of the proximal fragment. Here it is locked in displacement by the tension of all the extensor tendons of the wrist which are thrown across it like bowstrings. No amount of traction will move it, nor can you use a lever like the one shown in Figure 19 to reduce it. You would simply crush the bone more. We have contended that rarely is there any impaction, if by impaction we mean any particular degree of telescoping. Call it crush if you will, and you will be right.

X ray examination clearly reveals the condition; and if you look at an X-ray plate of a Colle's fracture after reduction you will find that, although you have felt the fragment move freely under your finger, which movement, of course, eliminates the question of impaction, there still will be remaining in the plate the evidence of crush even when the posterior dislocation has been overcome.

We must know the normal anatomical condition in order to form an opinion regarding the two planes of the wrist joint; that is, the lateral and antero-posterior planes. It is difficult to be absolutely certain of them, because there is no fixed point from which to start that under all conditions and positions of the hand remains the same. The distance from the tube at which the X-ray picture is taken will make a difference; therefore we recommend that in the X-ray examination 3 feet be the standard distance from the tube to the wrist, and the tube must be centered exactly over the break. In our researches we have depended upon angles, and these must of necessity vary somewhat, but we think that they approximate closely enough so that we are able to get a fair idea of the condition present. In order to determine the lateral angle make an antero-posterior X-ray exposure. On the developed plate draw a line straight down the center of the ulnar. (AB, fig. 1.) It will never be exactly the same but for practical purposes it will answer.

At its lower end, where it cuts the lower surface of the ulna, erect a perpendicular to AB. It will cut through the enlargement of the lower end of the radius. Do not measure from the ulnar styloid; it is too often broken. BC is this line. From B draw a line to the lower inner side of the radial styloid, BD. In a great majority this angle will be found to be between 16° and 22° , and it will not vary

greatly from this. Should there be much change in the plane of the articular surface it will show in the reading of this angle, and with this help it will be much easier to predict the subsequent amount of deviation. The nearer the line DB comes to CB the greater the change in the lateral plane of the joint, and the smaller the angle. (See fig. 3.)

Of even greater importance will be the measurement of the antero-posterior plane of the joint surface. This must be a true lateral view, without distortion. Draw a line straight down the center of the radius, ignoring the broken end (AB, fig. 2). Join this line by another perpendicular to AB, just touching the anterior inferior surface of the radius CD. Draw the line DE from D just touching the posterior inferior extremity of the radius at E. Normally the angle CDE will nearly always be an angle of between 15° and 20° , usually about 18° . It will rarely be less than 15° and equally rarely more than 20° , but the angle will always be in front of CD, the posterior side of the radius being always this much nearer the hand than the anterior.

When it approaches 10° in a broken radius there is suspicion of a change of plane antero-posteriorly, and in most cases it will show obliteration or even reversal of the angle (figs. 4, 5, 25, 27). If not corrected it will mean a certain prominence always of the wrist and a backward tendency to the hand. It is up to the individual operator whether he will attempt to correct this reversal, the actual dislocation having been overcome. At any rate he will thus be able to recognize the condition and be prepared to explain it satisfactorily to his patient.

This line or plane antero-posteriorly which many have assumed to be the anatomical line of the joint surface is no such thing. It is the X-ray plane and represents a line from the anterior edge of the radius diagonally across to the posterior-inferior edge at a point externally just beyond where it begins to flare out to form the shadow of the posterior edge of the radial styloid. To whatever condensation of bone it may be due, it is nevertheless always present and can always be depended upon to help us formulate an opinion. The line down the radial center cuts this point many times exactly, but it is always close to the line, and where this point is farther away from the radial line than the anterior-inferior point, it is proof of a remaining displacement. (See figs. 4 and 27.)

One must, however, be very careful or he will find that he is drawing his line to the shadow of the ulnar styloid instead of the point mentioned.

The wrist is a compact structure. Running through this restricted area, both front and back, are many tendons with their

tendon sheaths and slips of connective tissue binding them closely to the bone, blood vessels, nerves, and ligaments. The position of the hand as the patient falls relaxes all the extensor tendons at the back of the wrist and correspondingly tenses all the flexors. The flexor tendons, especially at the bending moment, are under a tremendous strain, and as the bone breaks, or even before, the connective tissue slips which tie these tendon sheaths to the bones are damaged, torn loose. These flexor sheaths and flexor tendons following strain, react to injury and we have effusion into the tendon sheaths and more or less bleeding.

If now the distal fragment is dislocated we may have further injury to the flexors, particularly the flexor carpi radialis, because of its insertion nearer the break and consequently greater tension by the sharp anterior surface of the proximal fragment.

The extensor tendons are not in tension, the wrist is hyperextended, the weight of the load plus the tension of all the flexor tendons force the fragment backward. The fragment tilts, slips backward, and the sharp posterior edge of the proximal fragment locks it, impingement. The extensors and abductors of the thumb and the radial nerve may be injured by the sharp posterior edge of this distal fragment as it goes backward into dislocation, but usually the injury is not severe. The extensor carpi radialis longior and the extensor carpi radialis brevis, because of their insertion comparatively near the fracture, are now tense across the distal fragment. The extensor longus and brevis pollicis, because of the same reason and their short lengths and oblique positions with reference to the distal fragment, are also under tension. There is injury to all these tendons, flexors, and extensors, the flexors during the production and the extensors from the dislocation of the fragments.

In a region which is so crowded with tendons and important structures as the wrist, an injury is always a serious matter, and as these cases are handled to-day a simple automobile crack seems to be quite as serious to the patient as a more serious break with dislocations. The joint is locked up in plaster or long splints, is looked at occasionally, and after three or four or even five weeks is worked, baked, and massaged. The patient is out of commission three, four, or five months, and many of them I have seen partially out of commission for over a year. None recover their motion for a long time, and some of them do not recover full motion at all. Deformity does not seem to influence the result so far as motion is concerned to the degree one would expect. A wrist without deformity often shows restriction of motion, while a badly replaced one shows more nearly a normal motion. This is in line with my

contention that there is a traumatic arthritis with effusion into the joint and inflammatory reaction to all the traumatized soft tissues and tendons.

As ordinarily treated the surgeon leaves this mass alone, rigid, to organize and bind down tendons and wrist structures and then expects normal motion. Is such an expectation rational? We might just as well open the wrist, turn in a quantity of glue or plaster of Paris, if it could be done, and then expect the joint to functionate.

The anterior radio-carpal ligaments may be torn, the posterior never, but I have purposely avoided mentioning them specifically. Their importance has been overestimated. They belong only in the concomitant injuries of soft tissue. They play no major part either in the mechanics of production of these fractures, their reduction, or their treatment. I know that I am controverting many pet theories, but I believe that they simply belong in the class of the generally injured soft structures. Of vastly more importance is the ruptured inferior radio-ulnar ligament, widening the joint by ulnar separation. This feature is adequately cared for by forcing the ulnar sufficiently backward.

Now as to treatment. It is absolutely necessary that the posterior fragment be reduced, and the reduction is usually a simple procedure. Flex the elbow. The first movement in the reduction is an exaggeration of the displacement backward. (See fig. 10.) This movement releases the tension of the extensor tendons and with left thumb over the fragment it can easily be pushed forward.

The second movement is adduction, the hand being thrown strongly to the ulna side with local pressure on the radial styloid process to push it downward toward the thumb and from behind forward, because there is a slight rotation or twist of the radial styloid outward and backward. (See fig. 11.)

With the hand in adduction force the wrist into extreme flexion. Push the hand down well beyond a right angle with the bones of the forearm. This is the all-important movement. (See fig. 12.) By this movement you can do more to restore the angle than by any other maneuver, and the subsequent limit of flexion will be determined in a great measure by the degree to which you flex the wrist in this first reduction. Fail to get this first reduction and you will always have some restriction of movement. In other words, the reduction of the actually dislocated fragment is one thing and the restoration of the normal antero-posterior angle of the articulation is quite another, and the latter replacement is almost never accomplished in the ordinary methods of treatment.

Let us assume the lateral displacement is reduced and the inferior fragment is released from its position of dislocation and pushed forward. The X-ray picture is nearly always much the same as that

shown in Figure 5 or Figure 6. This is the ordinary reduction usually obtained in good clinics, and the X-ray men call such a reduction a good reduction because they very rarely see any which present any different picture.

If you analyze these X-ray plates as we have done here, you will see that while the lateral angle has been restored, nevertheless the antero-posterior angle, as we called it, or the plane of the articulation, is not restored. (See fig. 6.)

Why do nearly all of these X-ray pictures taken after reduction and retention with the anterior and posterior splints or even with the anterior splint alone in position still show reversal? There are two reasons. First, because there is crush, loss of substance of cortical bone on the posterior side of the radius, and therefore a slight pressure anteriorly upon the fragment will always tend to tip the anterior-inferior edge of the radius downward. Second, the straight position of the hand tends to separate more easily the anterior surface of the break and to push backward the posterior surface, thus perpetuating the reversal, or even recreating it. The anterior-inferior edge is turned forward an equal distance as the posterior edge is turned backward and in the horizontal position. Both are on a lower plane than normal, and this is not restored.

By splinting in a fixed flexed and adducted position over a long period of time we can restore this angle, but such a restriction would be followed by a greater disability to the injured wrist than if treated otherwise, because the main requisite in the treatment of all these injured wrists is to begin active motion quickly if we are to secure desired results. A little deformity is not of great importance, except to a woman, but a loss of motion is a calamity.

The third indictment against the usual method of treatment is that even in those cases which are well reduced disability extends over long periods of time, and in many there is permanent restriction of motion.

We have proven by our researches that this lengthy disability is absolutely unnecessary. It is the result of the old methods of treatment and not the result of the tremendous damage due to the break.

In the usual method of treatment after the reduction, which as we have shown in ninety-nine cases out of one hundred is limited to a replacement of the posterior dislocated fragment, and which often falls short even of that, the injured forearm is placed in splints of various makes or in plaster and is left for a variable length of time. Once the posterior displacement has been actually reduced there are two lines of treatment by our method depending upon whether the antero-posterior angle as represented by our lines is in front of the perpendicular or behind. If it is in front, which is proof

that there is very little crush, and this is *not* usual, then a straight posterior splint with an ulna cut-out and a piece of board 2 inches by 2 inches well back of the break anteriorly is all that is necessary, and this posterior splint may be very rapidly reduced in size so that by the fourth, fifth, or sixth day it consists only of a narrow strip of well-padded wood along the posterior side of the radius reaching only from the middle of the forearm to the knuckles, the anterior pad being discarded about the sixth day. In reality it is only a reminder that the patient has broken his wrist and it prevents undue extension at the wrist joint.

Motion is begun immediately in all these cases, not passive motion but active. The fingers are left free, and from the day of injury the patient works the fingers constantly, picking up pins or pieces of wood several times a day to keep the fingers flexible. Up to about the fourth day the splints are left in situ, the bandages distal to the wrist being cut and removed, which frees the hand, and the hand is flexed to the right-angle limit which we attained in the first reduction ten to fifteen times once a day. It is perfectly surprising how easily the patient can do this. On the third or fourth day all the splints are removed. We take the patient to our lavatory and soak the wrist in very hot water, the patient meantime using the movement of flexion. Do not be afraid of these fractures. No recurrence of dislocation will take place. After the fourth day we begin active extension movements also, and by the tenth day, except in those cases showing a tremendous reversal after reduction, we have usually attained a possibility of 90° in flexion and 45° in extension activity. After this nothing but a wrist strap is used, with padding of sheet cotton under the strap. Such a strap is shown in Figure 20 and the ulnar cut-out is clearly in evidence. This must be used, because without an ulnar cut-out the pressure is uncomfortable and the ulnar is pushed forward instead of backward. The normal position of the ulna is posterior, and where it is pushed forward there is apt to be disappearance of the ulnar prominence. It must not be forgotten that always is there injury to the inferior radio-ulnar ligaments. From this time the patient uses his hand for all purposes where there is no particular stress thrown upon it.

Now, as we have said, there are two reductions: First, the reduction of the posterior dislocated fragment, and this is absolutely necessary for the restoration of motion at the wrist and for the free play of the tendons of the flexors and extensors; and, second, an ideal replacement which is not alone a reposition of the posteriorly dislocated fragment but is an actual restoration of the normal planes of the articulation as represented by our angles.

It must be clearly understood that the reduction of these posteriorly displaced fragments of the radius is one thing and the

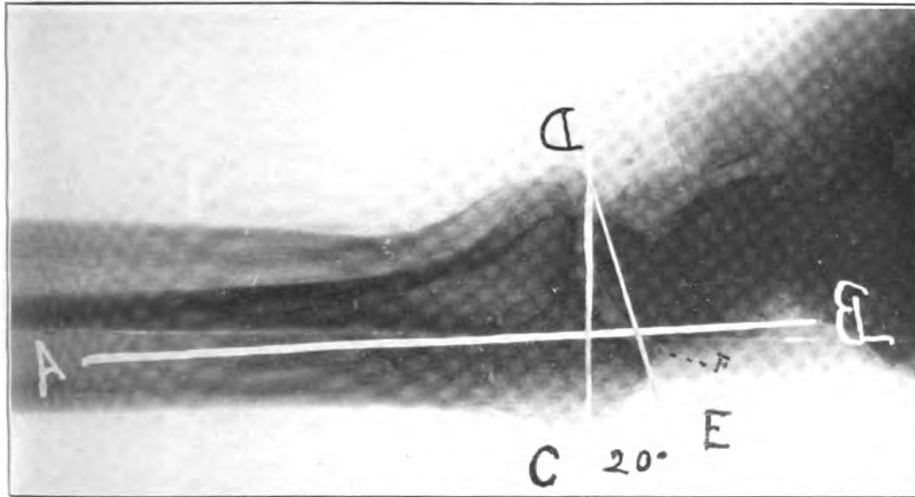


Fig. 2.—Normal antero-posterior angle. Note the relation of point F to the line AB

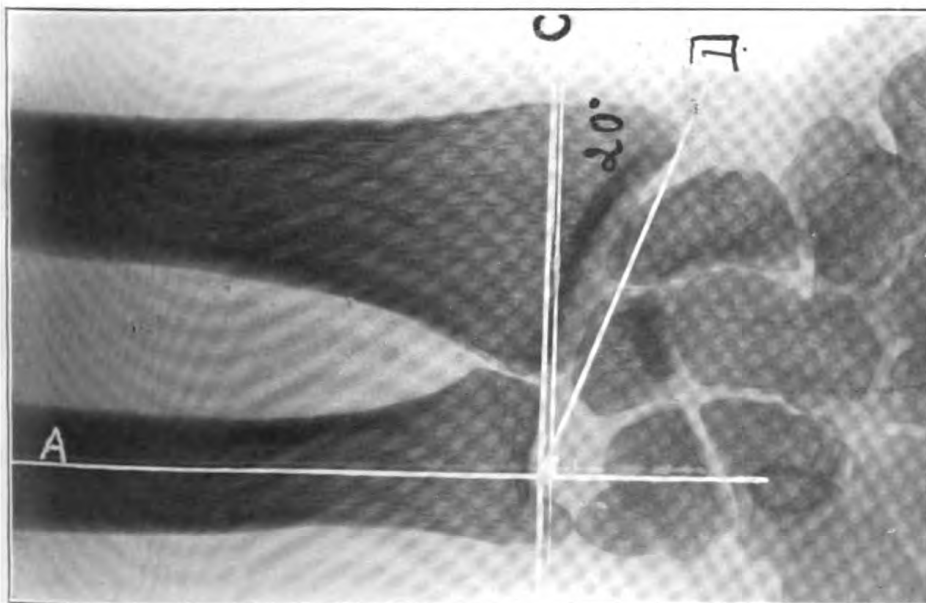


Fig. 1.—Normal lateral angle.

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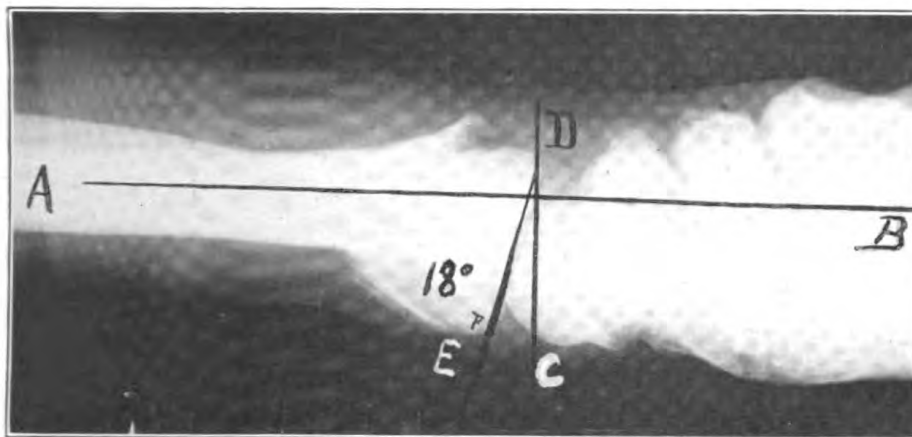


Fig. 4.—A badly dislocated fragment. Notice how far the point F is from the line AB and compare with the normal, 18° of reversal.

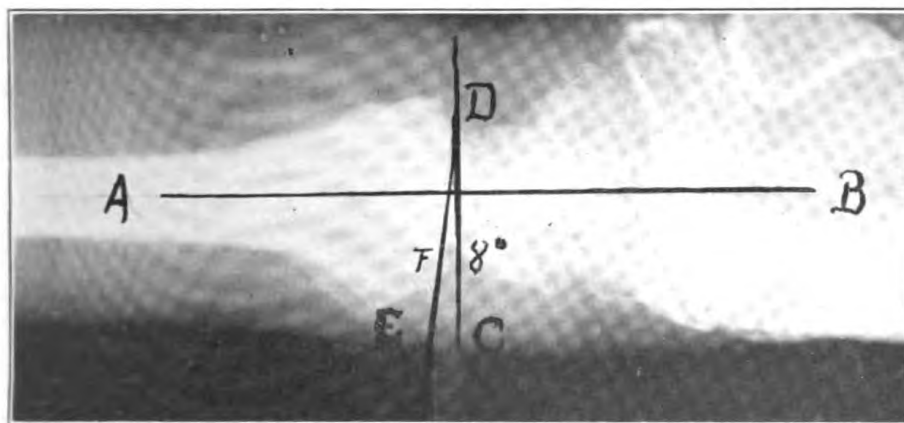


Fig. 5.—Reduction of the dislocated fragment 8° of reversal. Notice that point F is still a long distance away from the line AB. The X-ray men call such a reduction good because they rarely see any other. With such a reduction (only partial) by motion from the second day we can have a perfectly mobile wrist by the twelfth day with greater ease than with an acute-angled splint, but cosmetically there is apt to be a slight change and there will be a slight restriction in flexion. Immobilize this reduction even for two or three weeks and there will always be restriction.

Notice how the plaster strips and the pressure are directly over the break and are therefore pushing downward on the anterior inferior edge of the broken radius so that it tends not only to perpetuate the reversal but to recreate it had the reduction restored it. A 2-inch by 2-inch anterior splint well above the break would have tended to push back the proximal radial fragment and nothing anteriorly over the fragment itself would have released it, so that the pressure from the posterior splint below would have had the tendency to force this fragment anteriorly, turning the inferior posterior edge of the fragment forward and the anterior inferior edge in the opposite direction, exactly as a wheel turns, thus tending to restore the normal angle. Add flexion of the wrist and an angled splint and this reduction would have been ideal. See Figures 7 and 8.

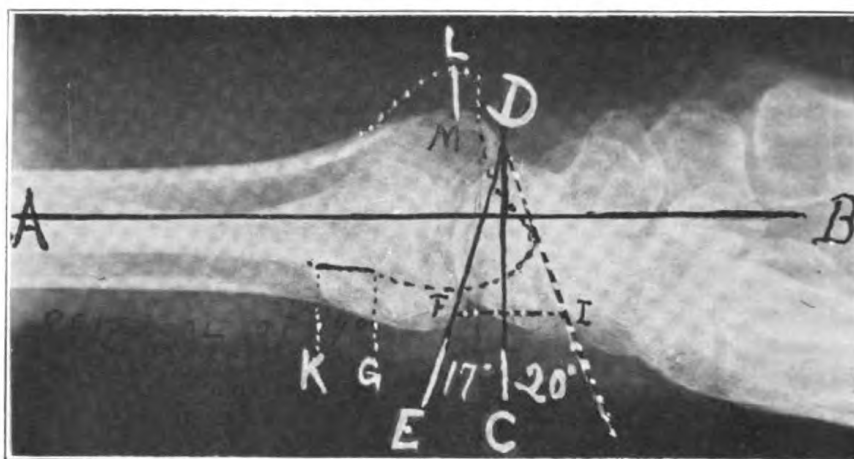


Fig. 6.—Actual posterior dislocation has been reduced. Nevertheless reversal of angle CDE. Note that the line DE is now behind DC. To estimate its change draw the dotted line in front of DC at 20° . This will be the plane of a normal restoration and the fragment must be forced forward and upward so that DE will be in front of DC in our final result. The better the restoration the nearer will the line AB come to point F. It will be clearly seen that while DI, the dotted line, is the plane of the normal joint in this case, it does not mean that the fragment must be forced forward until point F is at point I, because the entire fragment must be lifted up the distance which it has dropped, LM. And as the posterior inferior edge F is turned forward a sufficient distance to obliterate the crush, KG, the anterior edge is turned backward an equal distance. The correct position of the restoration as it should have been for this case is shown in the outline in dots. This is why FI, as drawn for estimate only, is twice KG always. And this explains why we have all of us in the past failed to restore this normal angle. We have been content to unlock the fragment and try to push forward the posterior edge. We have neglected to push backward the anterior edge, which was equally important, and we have failed to lift our fragments enough. Worse than all, had we succeeded in properly reducing them we would not have held them with the type of splint which all of us have used.

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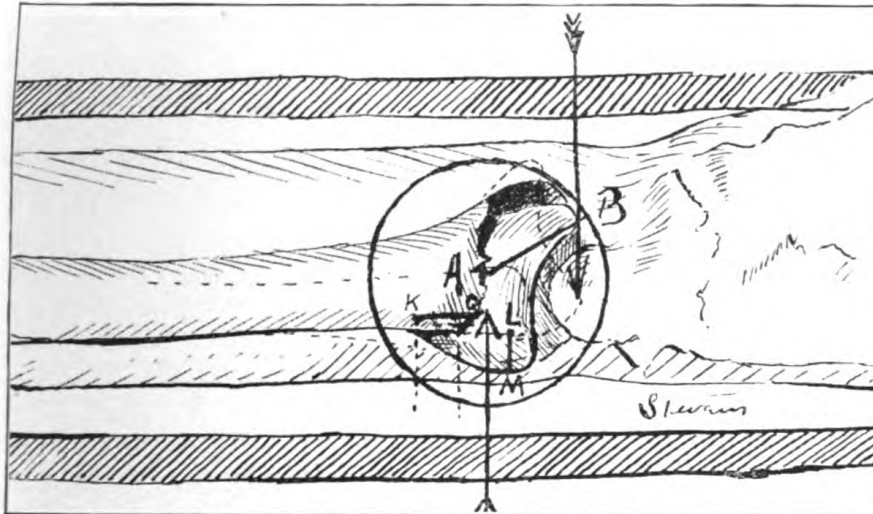


Fig. 7.—Showing the two points of pressure, with long anterior and posterior splints in place. With anterior splint alone the same picture is present, enhanced because the posterior lifting force is removed. Even with padding well back of the fragment there is no force tending to lift the fragment and turn it forward into place. Both these types of dressing tend to perpetuate the reversal. Note how the fragment, if considered as a part of a wheel, would turn, the posterior part down and back, the anterior down and forward, thus increasing the slant out of all proportion to the compression in evidence. This shows when the apparent crush, KG, is measured and it is found that twice this distance will be necessary to restore fully the angle. The tremendous distance which the posterior inferior edge of the distal fragment must be swung forward and upward in order to restore the normal plane, it must be remembered, is more apparent than real, because as the posterior edge swings forward and up into replacement, the anterior edge swings backward and upward, thus diminishing the distance which the posterior edge would have to move to accomplish full replacement. The fragment must be lifted up the distance it has dropped, LM, the posterior edge turned forward a distance equal to KG, and the anterior edge turned backward an equal distance. Reposition on this basis is outlined in dots to show the correctness of such a hypothesis. The so-called impaction posteriorly being in reality crush, it is clear that after reposition the slightest pressure in a downward direction on B would cause the reversal to reappear.

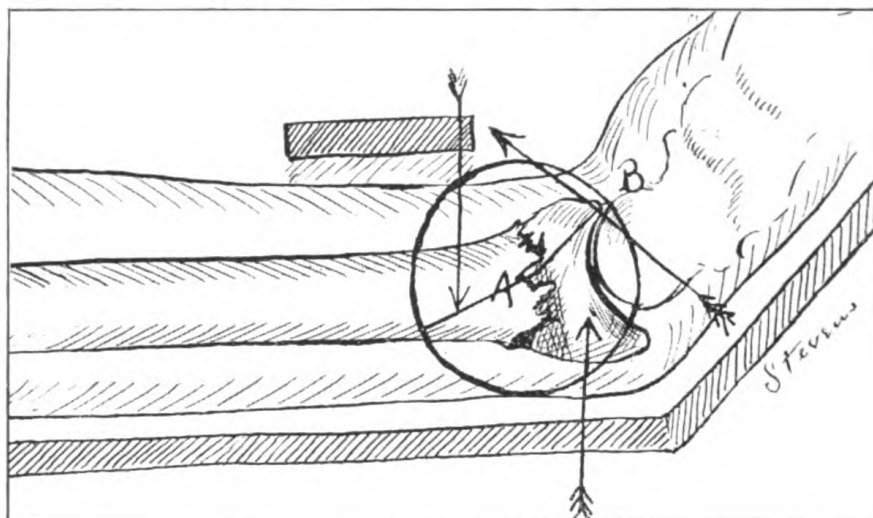


Fig. 8.—Showing the three points of pressure with our angled posterior splint and a small anterior pad. Imagine the broken inferior fragment as a part of a wheel, and force applied to its rim in the direction of the three arrows. In what direction would it turn? The radius of our wheel is the line AB, and the fragment is not only turned, but is held in place and the reversal of angle overcome. No form of straight splint anterior or posterior will accomplish this, and no form of specially molded anterior splint alone will do so. The angled posterior splint is the logical solution and the angle is varied to suit the individual case.

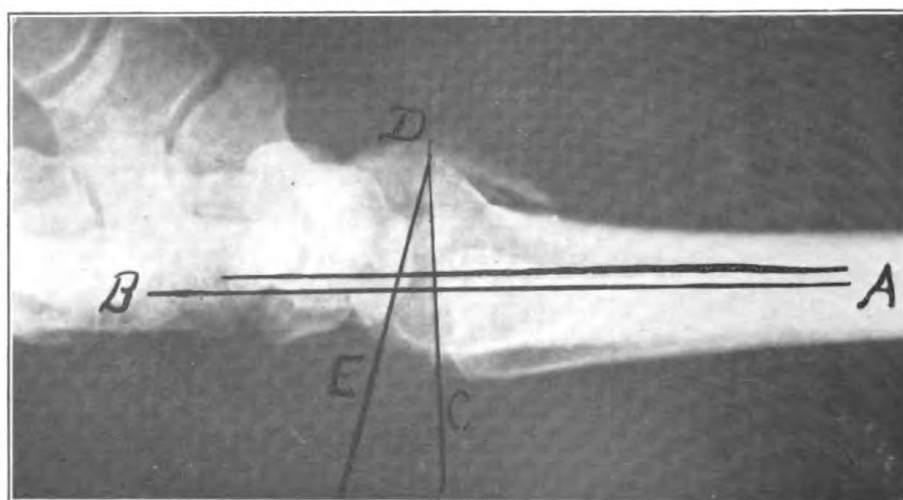


Fig. 9.—This is a shear fracture of the radial styloid running into the joint. There is no change of the antero-posterior angle. The lateral angle may, however, show change in this type. Obviously in this case there would be no advantage in an angled splint. Adduction would be the important thing.



Fig. 10.—First movement of reduction. This frees the fragment from the extensor tendons and impingement and the left thumb pushes the fragment directly forward and then toward the anterior surface of the wrist. Note force is being used in extension and also by the left thumb. It must go much farther back than this. The posterior dislocated fragment is reduced here.



Fig. 11.—Second movement of reduction. Forcible adduction. The posterior dislocation of the fragment is already reduced. Note left thumb is forcibly pushing the radial styloid to overcome adduction deformity and restore the lateral angle. Note that this movement is the second movement of our reduction and not the last, as usually taught. This adduction in a greatly changed lateral angle must be carried much farther out than shown here. This adduction to 30° at least is held. Not for a number of days is the hand again in a straight line with the forearm. The lateral dislocation is reduced here.

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Fig 12.—Third movement and most important. Flexion to below a right angle with the forearm. Most authors say flex, but if flexed short of this point it is of little value. This acute flexion restores the AP angle. Note that the hand is also kept in adduction during this movement. Note the operator's left thumb pushing the fragment forward with force. Flexion is easy if dislocation has been reduced. Any great amount of resistance is proof that dislocation has not been entirely overcome. If an angled splint is deemed necessary in the case it is now applied to the back of the arm and the hand carefully extended to meet it. Forty-five degrees is the best position. In these cases the hand never reaches the horizontal again for from 5 to 7 days.

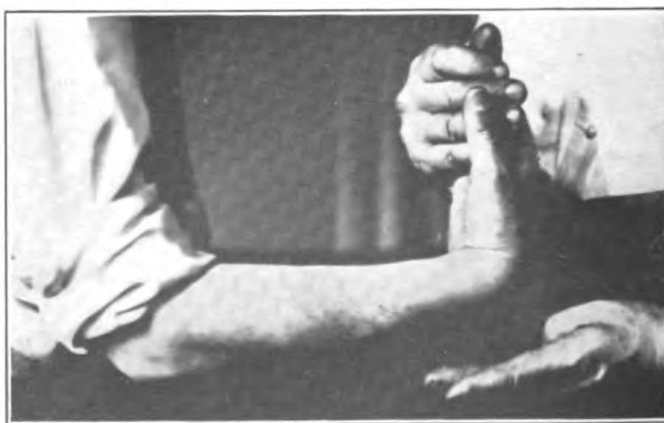


Fig. 13. —This shows the exact method of holding a Colles fracture after reduction. No harm can come to it if held in this position. This is the way we take it from the splint and take it to our lavatory daily.

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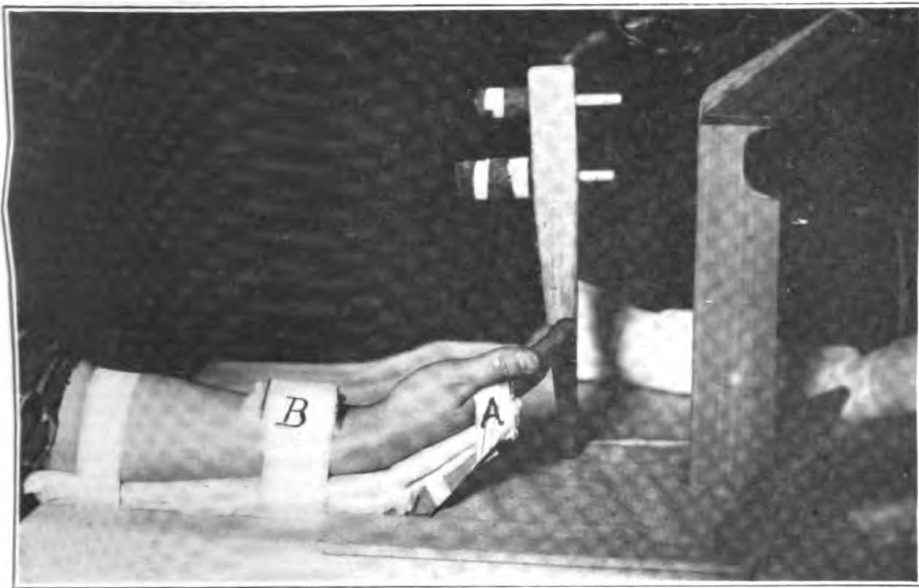


Fig. 14.—A completed dressing without the bandage. Wrench sometimes used. Splint unpadded, 40° flexion, 30° adduction. Splint unpadded, 45° flexion, 30° adduction. The splint used here was 35° in flexion, 30° adduction. Note the small anterior splint. This shows how simple it is to remove enough dressing for early mobilization and how easy to change the pressure at any time or, if necessary, to change to a greater or smaller angle. With plaster of Paris it is inconvenient, and such a dressing has the disadvantage attached to any long anterior splint. A plaster dressing of a radial fracture in flexion and adduction will restore the angle, but it will be much more easily handled by this wooden splint.

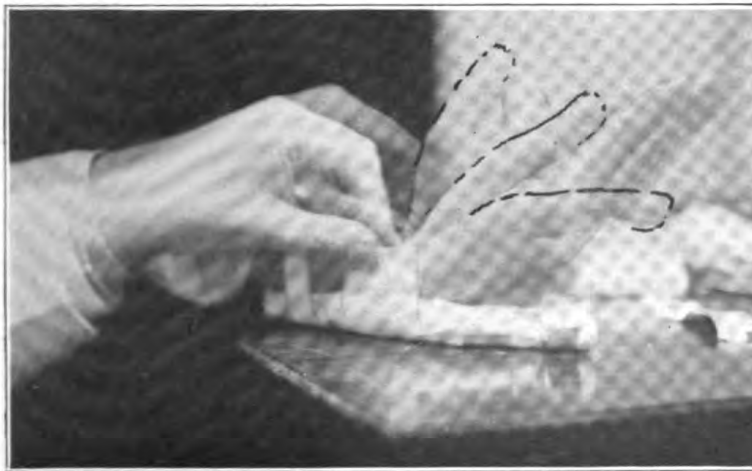


Fig. 15.—This shows the beginning of motion exactly as we use it on the second day. This case is a straight-splint case and here we have already discarded the long posterior splint for a short strip along the radial border, because it was not a reversal case and this is all it requires. Note that this three-exposure plate represents active and not passive motion. Note that this splint is in adduction of 30°. When we say straight splint we mean not flexed, but all our splints are adducted 30°.



Fig. 16. This shows the technic of active flexion on the second day of a reversal case. We use this every day until the fifth or seventh day. After that the entire forearm is taken from the splint and soaked in hot water, the hand kept flexed. On the fifth to seventh day these wrists are extended to straight position. After that extension movements are begun gently. Note this is active, not passive, motion.

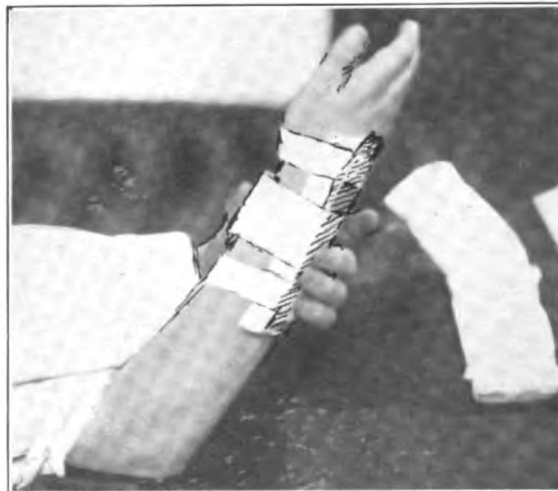


Fig. 17. -This represents the short straight dressing, the long splint being cut to a narrow strip 1 inch in width along the radial border after the third or fourth day in all straight-splint cases. It is adducted 30°, however, which does not seem to show here. After the sixth day in these cases the anterior pad is usually removed as well.





Fig. 18.—Shows technic of motion and position which we use after the first few days in all cases. After the fourth day in straight-splint cases. After the fifth to seventh day in reversal cases where we have used the angled splint. In the latter great care must be used in the movements of extension only. Note the three-exposure plate. Note position of operator's thumb over broken fragment. Active motion.

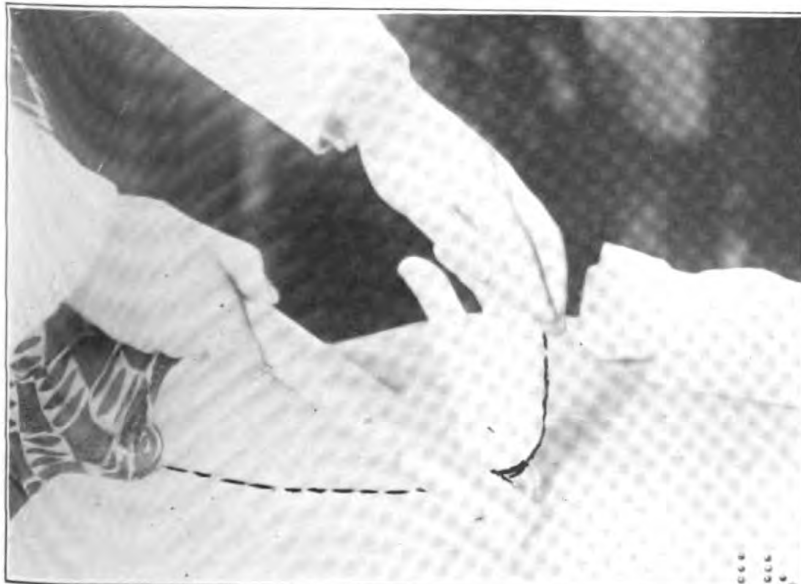


Fig. 19.—Shows exact method of using the wrench to lift the fragment. Seldom needed. Acute forcible flexion will usually be enough. Be careful if you use a wrench or you may convert a posterior dislocation into an anterior.

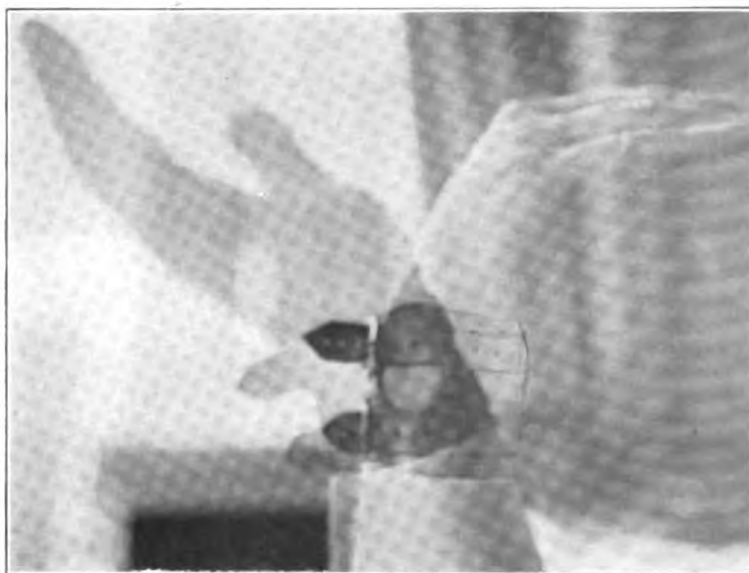


Fig. 20.—Leather wrist strap only dressing, used after 10 to 14 days unless complicated and unusual case. Note ulnar cut out. Restriction in motion due to strap. Patients take strap off themselves. Soak wrist in hot water several times daily and replace it after tenth day. During these daily soaks they exercise the wrist to the normal limits of motion.



Fig. 21. Shows motion on fourteenth day in one of these fractures. Equally good motion was present before. Motion is never lost from the first. If lost it is a long process to recover it and many times it is not recovered. This was a reversed angle case but treated in straight position because of unavoidable reasons, but motion was begun on the second day.

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Fig. 22.—This shows the usual deformity where reduction has failed and no attempt has been made to restore the angle.

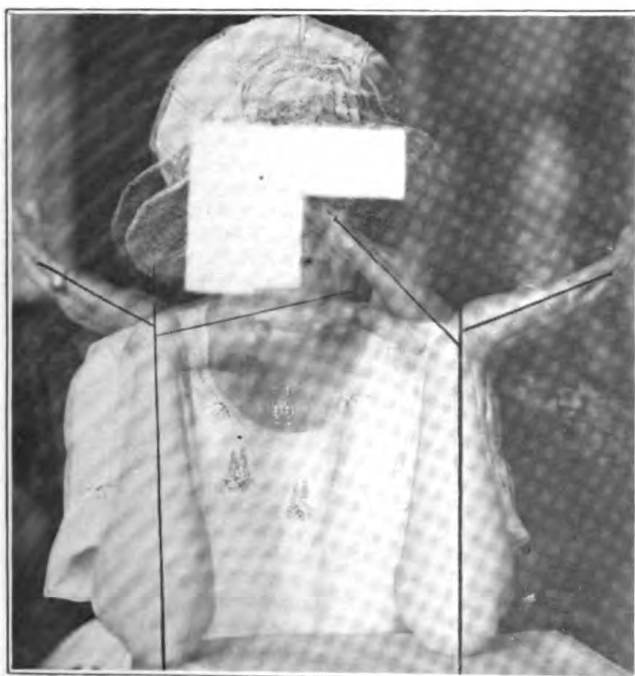


Fig. 23.—This shows the permanent restriction in flexion which has followed immobilization for four weeks. It is even more than shown here, as you will see if you draw the lines for yourself.

124—13



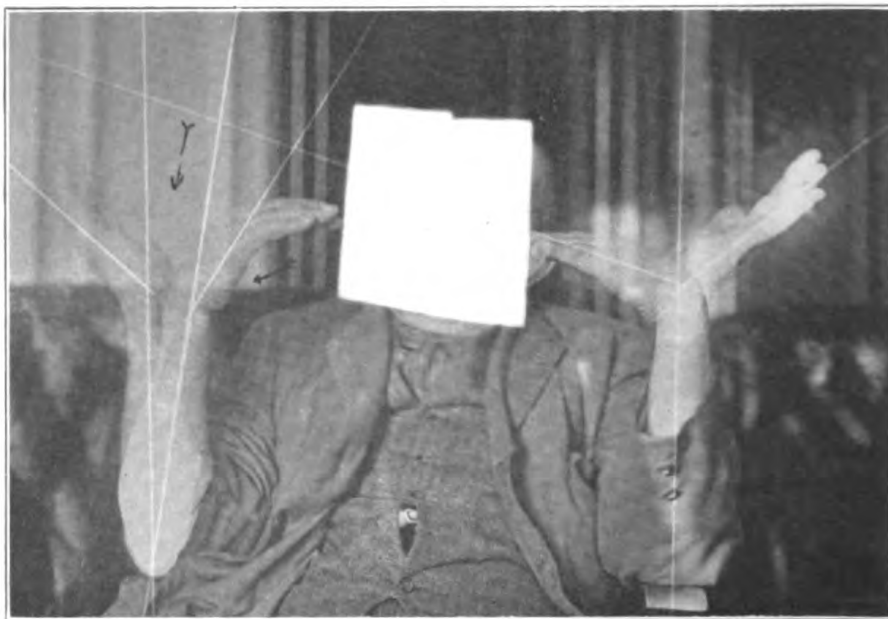


Fig. 24. -This shows the restriction in flexion following immobilization for five weeks. Treated in one of our great metropolitan hospitals. There was no especial complication in this case.

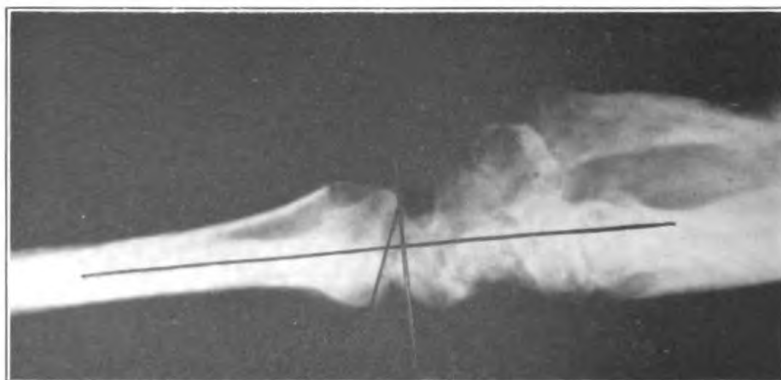


Fig. 25. This shows X ray of reversal and failure to replace a dislocated fragment.

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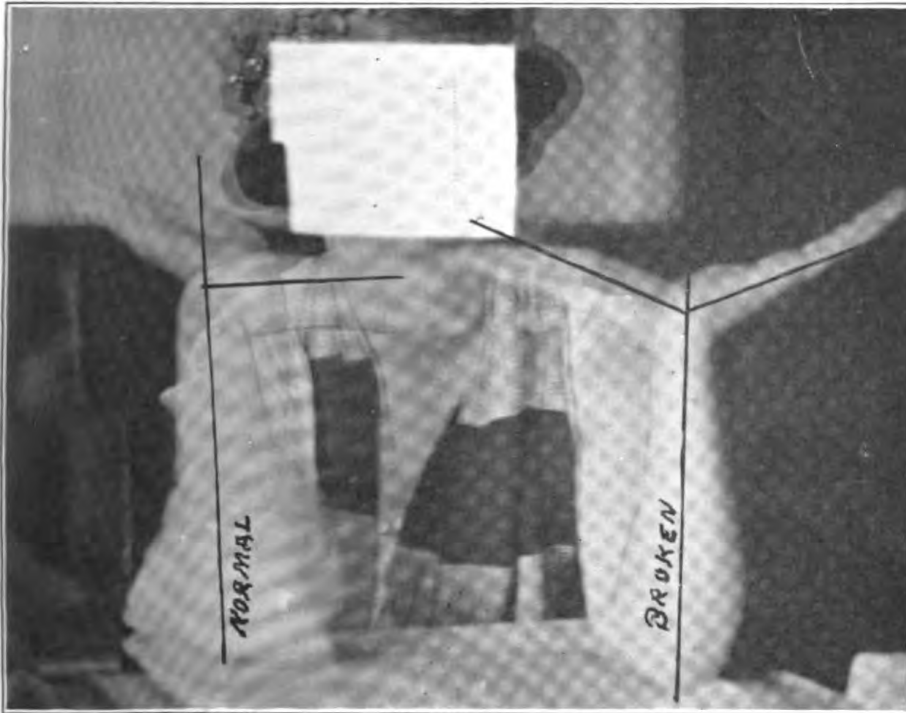


Fig. 26.—This shows the result obtained by this young woman in spite of the failure to reduce. X ray shows in Figure 25. This woman, not realizing the character of a fractured wrist, disregarded her doctor and took off her splints during the first week and used her hand thereafter. Cosmetically she has a badly deformed wrist, but motion, as you see, is better than the usual. This proves our contention. Active motion is the really important thing.

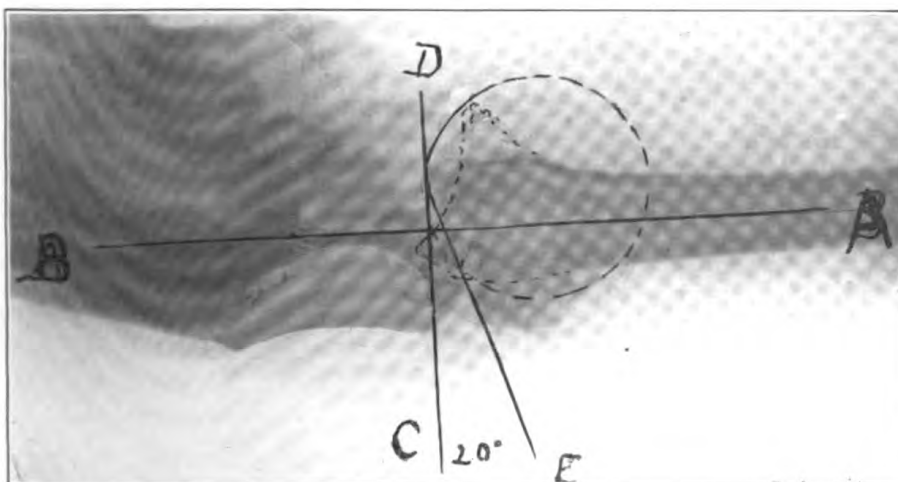


Fig. 27.—Shows a dislocated fragment with reversal. The dotted line shows where it must go to effect a good reduction and restoration of the angle. Result shows in Figure 28.

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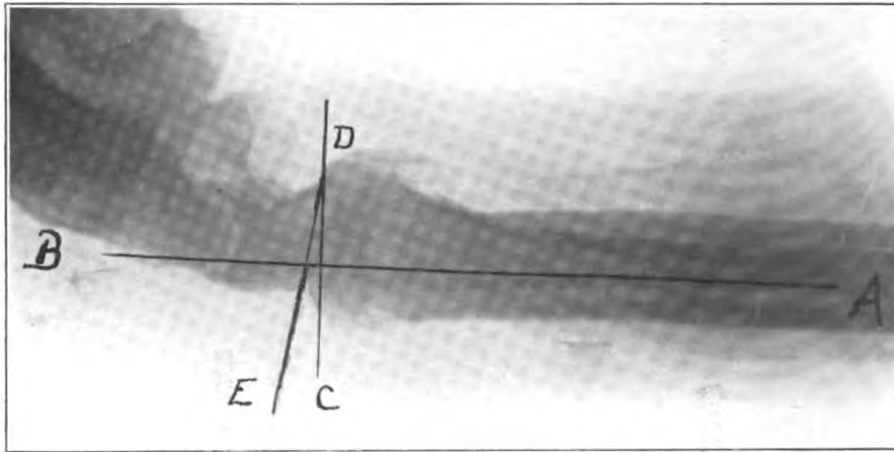


Fig. 28.- This shows that while we did not quite reach perfection, we restored the angle to the front of DC. Angled splint still in place. This reposition was accomplished by forcible flexion alone. A spicule of bone shows anteriorly. Pressure of thumb later can correct this. It is more from the radial styloid. Notice that the anterior 2-inch by 2-inch splint is well above the break and its pressure is on the proximal end. Original X ray shows in Figure 27.

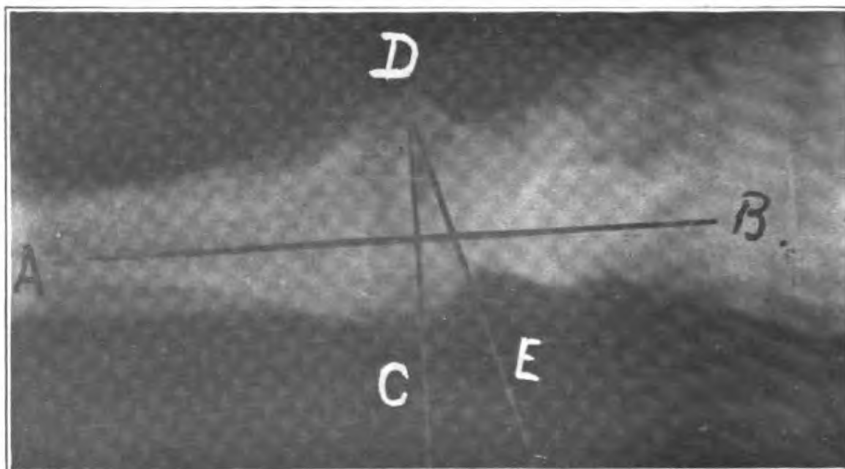


Fig. 29.-This shows replacement and restoration of the AP angle in a badly reversed case, by acute flexion and the angled splint. Picture made on sixth day with hand in straight position to show that it retains the position and does not slip or turn back to any extent.

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Fig. 30.—This was a reversed angle case and also a badly dislocated fragment. The X ray of the reduction is shown in Figure 29. This shows motion on the twelfth day. A double exposure to show both flexion and extension. Discharged on the twentieth day. Note that the fingers are kept straight. This is essential or you will fool yourself. Note that the elbow is flexed. Full flexion of the hand is possible only with a flexed elbow.

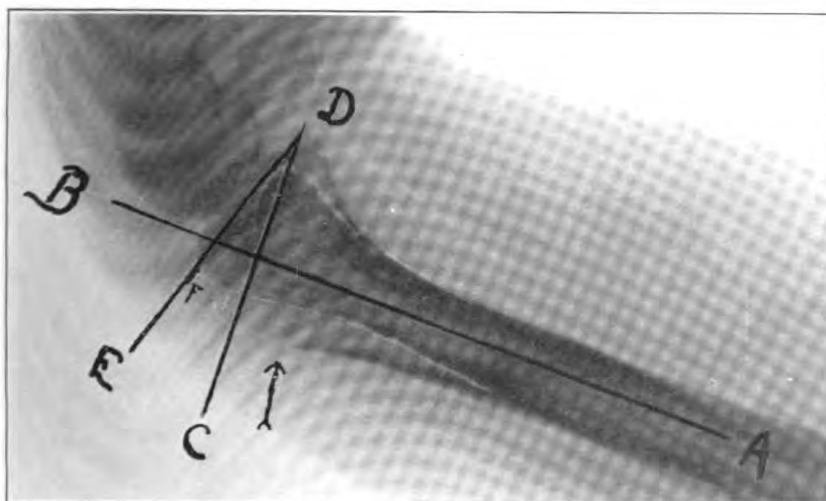


Fig. 31.—Restoration to normal of a badly dislocated fragment. Note the separation of the line of fracture posteriorly by this position. In this case the wrench was used. Note how the ulnar styloid is superimposed over the point to which we draw the line DE; that is, point F in this case. Result shows in Figure 32.

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124—17



Fig. 32. -This shows motion actively in flexion on the eighth day in this restored angle case. Note swelling of back of hand. Much tenderness as well, but of back of hand and not the wrist. This was an arthritic type and disappointed me in extension, the recovery of which was slower, partly due to her inability to come every day for motion. This is the position we use for motion after the fourth day wherever we use a straight position and also after the fifth to seventh day in these cases where the angle has been restored by the flexion and they have been put up in an angled splint. During extension we support the wrist with our hand.

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restoration of the antero-posterior angle is quite another, and this restoration is desirable in the majority of Colle's fractures.

The restoration of the antero-posterior angle can only be accomplished by an acute flexion of the wrist. You will see by examining Figure 8 exactly what we mean.

In a woman's arm, where cosmetic results are almost as important as mobility, this is a matter of importance, but in industrial life and in a military machine it is a matter of secondary importance. The main thing is motion.

Now, if you put this wrist in plaster or splints in this position of extreme flexion and adduction and leave it until the break has healed, you will succeed in restoring to a practical anatomic perfection the normal planes of the joint. Glance at Figures 7 and 8 and you will see the reason why this is so and at the same time you will see why in any position a long anterior splint is a menace. Cosmetically you will have accomplished a perfect result, but your function will be far from perfect. It will be better than it was in the old days, but the restriction will be pronounced, especially in extension, where before it was restriction in flexion. This is because while the reposition is perfect, the joint and tissues traumatized and filled with effusion have been permitted to organize in this position.

We have attempted to combine our two methods, and not only restore the planes but recover motion.

Is it not possible to accomplish both of these much-to-be-desired results? The logical position after the reduction of fracture at the lower end of the radius with reversal is flexion in adduction. In the cases without reversal, which are rare, however, it is not even an advantage. We use a posterior splint angled at the wrist 35° to 45° in flexion and 30° in adduction, reaching from the wrist to the proximal ends of the phalanges. (See fig. 14.)

There is an ulnar cut-out and the splint is narrower than the wrist. This prevents the tendency to separation of the radius and ulna which is present where wide splints are used, especially when both anterior and posterior splints are employed. Keep the ulna and radius together at their inferior articulation so that the torn inferior radio-ulnar ligaments may heal. Use anteriorly a small well-padded 2 by 2 inch splint well back of the lower fragment.

Where the crumpling up has been tremendous and there is difficulty in reduction, the implement represented in Figure 19 which we use and have found efficient, may be used, but remember that this implement is never to be used until the bowstring tension has been released. It is the last thing to use in order to obliterate the last vestige of reversal of angle. It is never to be used as an instrument for reducing the fragment. If used in that way, a great deal of

damage could be done by accentuating the crushing. The instrument is used exactly as shown in the illustration, and may also be used for restoring the lateral plane or angle as well. By leverage, gently but firmly, we can now pry up the posterior surface of the displaced fragment while exerting pressure backward against the proximal shaft of the radius until the normal prominence of the inferior radial articular surface is restored. Great care must be used or you will convert a posterior displacement into an anterior one. The usual case does not need it. Flexing the wrist below a right angle and holding it by the angled splint will be sufficient.

We know that with the straight position while the inferior fragment has only been half reduced, nevertheless we can by the use of quick motion get a perfectly flexible wrist by the fourteenth to twentieth day and can discharge our case by the twenty-first day with a flexion approaching 90° and an extension in excess of 45° which is sufficient. Oftentimes extension will be greater than normal, which is easily understood.

Can we do so with the acutely flexed position? If we can not, then, although it is a better anatomical replacement than the other, we must abandon it, because, after all, mobility is the main thing.

Experience has taught us that if we leave our cases too long in this acutely flexed position we are about as bad off as we were before, except that the delay in recovery will be in extension instead of flexion.

We have found that we must begin motion here almost as quickly as in the case of the straight splint. From the second to the fourth or fifth day we place the forearm on a flat surface, release the bandages holding the hand in the splint and permit the patient to flex the wrist as far as possible. Extension is prevented because we leave the posterior splint in situ, only releasing the hand to the wrist for motion, and we gently aid this active flexion by pushing the hand down to a right angle with the bones of the forearm. (Fig. 16.)

On the fifth day all the splints are removed and the hand is soaked in hot water, holding it flexed, and several times we permit the patient to actively extend the wrist as far as the straight position.

By the seventh day we are not only flexing the hand fully, but we are permitting the beginning of active extension to 20° , and from this time on we endeavor to get the full range of extension as well as flexion. (Fig. 18.)

On the seventh day we usually change from our angled splint to a small straight splint reaching from just above the fracture to the middle of the hand, but adducted to 30° .

Do we jeopardize our position of anatomical replacement by this early change of position and this early extension of the wrist?

To a certain extent, yes; but not enough, if care is observed, to cause renewal of the reversal. By extension of the wrist early there is in this acutely flexed position a tendency for the anterior edge of the inferior fragment to turn downward and forward. In the straight position there is nothing to fear in the handling of these fractures by early mobilization. Why? Because the inferior fragment is as badly out of place as it can be without actual dislocation backward, and this will not occur. In the acutely flexed position there is actual anatomical replacement and also a distinct tendency to recurrence of the reversal with early extension, but it is the lesser of two evils, and with care it is slight.

We noticed by a careful study of the X-ray plates taken from day to day in the experimental stages of our method that there was a slight change in the lines of the articulation and that there was a tendency to a separation of the fragment on the anterior surface of the radius, but it was not sufficient to cause us any disturbance. We were fearful of this in our first cases, but it was a case of the devil and the deep sea. We had demonstrated that if we left them too long in the acutely flexed position there was a certain restriction in extension and they did not recover motion with the ease and uniformity which followed the straight position. In young people or in early adult life a few days more or less made little difference, but in the old even a restriction of 10 days of the motion of extension was followed by a loss of motion which was noticeable and which meant work to overcome. So that we were forced to begin motion in extension, especially in the elderly type, by the fifth to the seventh day and to change permanently to the straight position by the seventh day.

This was more satisfactory and we found that rarely did it affect the restoration of angle and that it gave us results which were as good as before from the standpoint of mobility and which are better from the cosmetic side.

After the tenth to twelfth day we use nothing but a leather wrist strap. (See fig. 20.)

From this time on the patient uses the hand for all ordinary purposes which are not accompanied by strain, but with care and common sense. An individual with a fracture of this type is not expected to throw a baseball or pull an oar on the twelfth, fifteenth, or twenty-first day, and it is not necessary that he should. If he is the type of individual who expects to do these foolish stunts, and there are some who do, or the type who is not intelligent enough to understand the limitations, then he must be restricted for a longer period and so protected against himself.

This article up to the present has dealt with the ordinary type of Colles fracture, with or without the evidence of great compres-

sion. In the so-called abduction type, where there is great obliquity of the split, more care will have to be observed, especially where there is a tendency to recurrence after replacement, but fortunately these are rare, and it must not be forgotten that nature has placed a better splint about the injured radii than we can do.

The flexor and extensor tendons are closely applied to the bone and once replacement is effected there is very rarely any tendency to recurrence of the actual dislocation.

The sheer fractures involving the styloid of the radius alone are of little importance if treated by this method, the main point in their treatment being the flexion of the elbow to relax the supinator longus tendon and the adduction position.

In the greatly displaced and comminuted type results will depend almost entirely on one's ability to reduce, but where contact can be secured between the ends of the fragments quick and gentle motion will deliver results in mobility even where cosmetic results leave much to be desired. (See 25 and 26.)

Reduce the displacement, begin motion early, and get away from all retentive apparatus as quickly as possible in these joint injuries, and we shall no longer have wrists which show a permanent disability following even the simplest of these compression fractures of the lower end of the radius.

JUXTAPYLORIC ULCER.

By G. F. COTTLE, Lieutenant Commander, Medical Corps, United States Navy.

As medical officer of a naval vessel en route to Europe in 1914, while verifying the health records of a draft of men recently taken aboard from the receiving ship at the home yard, I came upon the entry "Duodenal ulcer." The story was one of several admissions to hospital, each for considerable periods of time, with periods of intensive medical treatment. The record was that of a chief petty officer of many years' service, over 30 years of age. When he entered the sick bay he displayed the usual reluctance of the older service man to admit that he was sick. He stated that his old trouble had left him, that he felt himself to be cured, and in fact he looked quite well. He was permitted to return to his duty with the advice to come to the sick bay if his symptoms returned. Some days later while walking on deck I was struck by the pallid countenance of a man who was standing on deck, and upon speaking to him I recognized the chief in whose medical record this entry appeared. He still insisted that he was well and that he was not going to be a quitter and was reluctant to go with me to the sick bay. With difficulty I was able to extract from him a story of weakness and a

fainting spell. After a little talk he consented to the proposition to go on the sick list and to turn in. Examination of his stool showed it to be tarry black. A few days later, the ship having entered a French port, it was thought best to place him in the French naval hospital. At the end of a week, the ship being ready to sail, the doctors of the French hospital informed me that they were expecting to receive the sick and wounded from the first great advance of the German Army, which was then in progress, and they requested that he be taken back to the ship. After careful consideration of all the circumstances, and as the ship was to make the short trip to England, the patient was brought back for transportation to a British hospital. That night while crossing the channel he died exsanguinated, and autopsy revealed a large duodenal ulcer and an intestinal content of altered blood.

During the years that have come and gone since then I have recognized not a single case of duodenal ulcer among patients that have come to me from the active naval service, either at sea or ashore, though recently a few cases have come to my notice among patients drawn from the retired personnel and from the veteran group. I have often wondered whether this nonappearance of the ulcer-bearing patient in my clinical experience was due to an inability to recognize such a case when present or due to a rarity of incidence among members of the active personnel. With this quandary, among a host of others in mind, I left my station in obedience to orders from the Navy Department to spend three months in observation and study at the Mayo Clinic, Rochester, Minn.

The Mayo Clinic is well known as perhaps the largest and most successful single exponent of that type of medical and surgical practice called group medicine. Its staff of approximately 300 doctors, with an annual clientele of approximately 50,000 patients, situated in a small city of the Northwest, is a center of an intense medicosurgical activity famous throughout the world for its leadership. Its spirit of hospitality to the medical profession brings to its doors, as visitors, physicians and surgeons from all over the United States and even from many foreign countries. Among its surgeons, internists, and specialists in many lines of medical activity are found leaders of recognized position, who succeed in giving to their patients a degree of diagnostic and therapeutic satisfaction sufficient to keep people coming in great numbers from distances far and near. The celerity with which clinical, laboratory, and X-ray findings are made and the way in which special consultations in otology, rhinology, dentistry, neurology, urology, syphilology, orthopedics, pediatrics, gynecology, and the various subdivisions of general medicine are correlated into a clinic picture, upon which the final diagnostic and

therapeutic decision rests, is the result of a remarkable harmony and unity of interest and is an outgrowth of the leadership of a master mind. The willingness of the individual members of the staff to permit detailed close inspection of their methods is a protection to the welfare of their patients and a tribute to the integrity, idealism, and efficiency of their work. I was fortunate in being permitted to spend a month in the section of gastroenterology, of which Dr. George B. Eusterman is chief. During this period I was permitted to review with the consultants case histories, physical examinations, laboratory and X-ray findings, to be present at special and surgical consultations, all in contact with the patient, and to see the surgical pathology demonstrated in the operating rooms and in the pathological laboratory. Part of the time, by taking histories and handling patients myself, I was able to get an even more intimate view of the methods of the clinic. During this period I saw 143 patients who came to the clinic because of stomach complaint, and of these took histories of 52. Among these patients were duodenal and gastric ulcers; cholecystitis, with and without stones; carcinoma of stomach, rectum, and esophagus; nephrolithiasis; tabes dorsalis; exophthalmic goiter; pelvic disorders; neurasthenia; functional disturbances of the stomach.

While this experience has served to convince me that the symptoms which cause people to complain of their stomachs are often baffling in the extreme, and while it has in no way fitted me to write anything original upon this extremely interesting phase of medico-surgical practice, it has, nevertheless, led me to formulate a few broad generalities that may prove of value when cases of this sort come in the course of naval practice. Many able papers have been published by various members of the Mayo Clinic staff on the medical and surgical aspects of gastroenterology. These papers are available in the collected papers published in book form each year by the Mayo Clinic, and they deal in a most practical and straightforward manner with the subject.

The term "juxtapyloric ulcer" includes the duodenal and gastric variety. The older designation "peptic ulcer" is not as accurate a title, because the duodenal and the gastric ulcer syndromes are in practice often indistinguishable, and the word "peptic" would seem to designate a gastric and not a duodenal location. The great majority are near the pylorus, 87 per cent being on the duodenal side, 12 per cent being at or near the lesser curvature of the stomach, and those elsewhere in the stomach only 1 per cent. While the incidence of ulcer in gastroenterologic practice is high, it has been estimated that in general practice only 1 per cent of a total of 406,000 patients were recorded as having this lesion. In a total of 59,450 autopsies for all causes, scars of ulcer, or open ulcer, were found in 4.4 per cent.

The symptoms may be clear, they may be obscure, they may be combined with other symptomatology, they may be absent altogether.

In perhaps 25 per cent of the patients who actually have an ulcer of the stomach or duodenum, there is a clearly defined history of a combination of epigastric pain or distress, accompanied by subjective sensations, clinically associated with hyperacid stomach. When a man of, for example, 35 years of age says that for a period of several years he has had pain, accompanied by heartburn, water brash, and belching, coming on regularly two to three hours after meals, and waking him at 2 a. m.; that the pain is relieved by drinking water or milk, or by taking soda, disappearing at meal time, worse in the spring and fall, and sometimes entirely absent for periods of several weeks or a few months; when in such a patient physical examination shows a tender spot in the epigastrium corresponding in location to the pain area, and a stomach content with a continuous high acidity and high HCl; when this patient tells practically the same story on more than one day, duodenal ulcer is a diagnosis that fits the story and needs the X-ray only as an additional bit of confirmatory evidence.

Few ulcer-bearing patients, however, clearly give this history. Perhaps 75 per cent of them give part of this picture. A few show achlorhydria or subacidity. In others the pain is not characteristic in time, intensity, location, periodicity, or in its method or degree of relief, or to the clinical picture are added other factors brought forward by the patient in such a manner as to confuse or mislead any but the most experienced and able gastroenterologists. It requires long familiarity with this type of case and a special clinical acumen to disentangle some presentations of data as given by patients and see in the final picture a suggestion of ulcer sufficiently clear to warrant a tentative clinical diagnosis of that condition. It is claimed by conservative clinicians in this specialty of internal medicine that the properly taken history, physical examination, and laboratory findings insure an accuracy for them in diagnosis of perhaps 80 per cent. Some clinicians of greater ability, or more optimistic in regard to their diagnostic ability, claim a higher percentage of accuracy, based on clinical findings alone. In approximately 20 per cent of ulcer-bearing patients the clinical evidence is so difficult to properly evaluate that errors in diagnosis are not infrequent, while in approximately 5 per cent they are so difficult of interpretation, or clinically atypical, as to make the diagnosis an impossibility on the clinical picture obtainable.

To the roentgenologist of special training and ability in the field of gastroenterological diagnosis, the clinician often turns for something more than confirmation. From him is received definite

evidence to support a tentative diagnosis, and in a small percentage of cases with atypical histories, an ulcer will be visualized by fluroscopy which could not have been diagnosed in any other way. The value of the highly specialized roentgenologist in the field of operative gastroenterology is obvious when, based upon a series of several hundred duodenal and gastric ulcers demonstrated on the operating table, statistics show X-ray findings to have been correct in upward of 95 per cent, and in a series of several hundred laparotomies for other abdominal conditions, in which at operation no ulcer was found, statistics show approximately 95 per cent to have been negative for ulcer by the X ray.

Very few clinicians and roentgenologists are so situated as to be able to judge of their own diagnostic accuracy by a series of several hundred recorded diagnoses, to which has been applied the crucial test of surgical interference.

The physician whose opportunity to study the ulcer-bearing patient is less than the opportunity of the specialist in this field, should realize that even under the most favorable conditions there is a certain unavoidable percentage of error. In decisions made for his patients he should be governed by a careful estimate of his own probable degree of accuracy and an estimate of the probable accuracy of the roentgenologic findings available in his practice. In the endeavor to recognize the ulcer-bearing patient, it must not be forgotten that epigastric pain, vomiting, hematemesis, melena, and that train of symptoms sometimes summarized by the word "indigestion," either alone or in combination, may be the expression of one or more of a host of conditions other than ulcer. The patient who comes with a story of "stomach complaint" may have a lesion in the esophagus, stomach, or duodenum, his symptoms may be the expression of pathology elsewhere in the body, or they may be a reflex in the stomach from abnormal conditions either in the stomach or elsewhere, for which one or more of a very wide range of conditions may, in the last analysis, be found responsible. So sensitive is the proper correlation of the complex innervation and physiology of the upper digestive tract that the pathological entities and functional disturbances capable of causing an imbalance sufficient to be expressed in symptoms referable to the stomach are very great in number.

The list of disorders from which ulcer must be differentiated is a formidable one. Many of these possibilities can be readily eliminated by the history, many by the physical examination and laboratory findings, a few by means of the gastric analysis, some by the X ray. Even when all these methods have been applied the issue may be in doubt in a few cases until the exploratory incision of the surgeon, or post-mortem findings, reveal the underlying pathology. One may

consider the conditions that underly stomach complaint to fall into classes such as intrinsic or extrinsic, organic, functional or reflex, or the conditions may be listed more or less anatomically as follows:

1. *Stomach, esophagus, and duodenum.*—(a) *Esophagus*: Malformation, diverticula, stricture, carcinoma, etc. (b) *Stomach*: Benign ulcer—acute, chronic, perforating, perforated, postoperative. Carcinoma—pyloric, body, cardia. Benign tumor—fibroma, papiloma, angioma, polypus. Syphilis, tuberculosis, lymphosarcoma. (c) *Duodenum*: Ulcer, acute, chronic, perforating, perforated, carcinoma.

2. *Organic conditions outside the esophagus, stomach, and duodenum.*—(a) *Intestinal*: Appendicitis, acute and chronic, enteritis, peritonitis, intestinal obstruction, indigestion. (b) *Rectal*: Indicanemic conditions, habitual constipation, carcinoma, hemorrhoids. (c) *Biliary*: Cholecystitis with or without stones, cholangitis, biliary carcinoma. (d) *Liver*: Acute yellow atrophy, perihepatitis, hepatitis (cirrhosis). (e) *Pancreas*: Calculi, cysts, pancreatitis (acute, chronic, hemorrhagic), carcinoma. (f) *Kidney*: Nephritis, tuberculosis, renal and ureteral stones. (g) *Heart*: Arteriosclerosis (angina), functional cardiac conditions, endocarditis, myocarditis. (h) *Lungs*: Tuberculosis. (i) *Uterus and adnexa*: Gastrointestinal reflexes, vomiting of pregnancy. (j) *Disturbances of metabolism*: Pernicious anemia, chlorosis, secondary anemia, diabetes, gout, syphilis, poison (lead colic), arsenic, etc., purpura, hemophilia. (k) *Neurological*: Epilepsy, chorea, brain tumor, locomotor ataxia, hysteria, neurasthenia, and nervous dyspepsia. *Reflex*: Cerebral, spinal, cardiovascular, visceral, urogenital, traumatic. (l) *Endocrine disturbances*: Exophthalmic goiter, Addison's disease.

3. *Functional disturbances of the stomach.*—(a) *Disturbances of secretion*: Hyperacidity, hyperchlorhydria, hypersecretion, gastro-succorrhea, subacidity, anacidity, achylia. (b) *Disturbances of sensation*: Hyperæsthesia gastrica, gastralgia, bulimia, anorexia. (c) *Disturbances of motility*: Cardiospasm, gastrospasm, pylorospasm, regurgitation, ærophagia, vomitus nervosus, reversed peristalsis, hypermotility, deficient motility.

In this long list of possibilities one finds actual stomach pathology limited to a few entities; ulcer, carcinoma, gastritis and those very rare conditions; benign tumor, syphilis, and tuberculous. All the remainder are functional, or reflex. The reflex group have in most instances a firm basis in recognizable pathology, or definite disease entities. There are cases, however, and they occur with considerable frequency, which, by exclusion, fall into the functional or into the nervous group. A diagnosis made in these groups may not work for the best interests of the patient if the clinician considers it in any light other than a tentative working hypothesis under which to

institute treatment. Increasing knowledge makes these groups smaller and smaller. One should not be content with the diagnosis of functional stomach or nervous dyspepsia, until treatment instituted to correct the function or to remove the neurosis ends in cure of the patient and permanent disappearance of the symptoms.

The necessity for a careful physical examination in the diagnosis of ulcer needs no comment except to emphasize the importance of thoroughness. The tonsils and the teeth should be closely examined, because it seems well established that many abdominal complaints, and perhaps ulcer itself, may be closely related to, or at any rate markedly influenced by, dental and oral sepsis. An examination of the eye grounds may clearly show evidences of nephritis or hypertension, the relation of which either to diagnosis or treatment is of great importance. Digital examination of the rectum, a too often neglected procedure, may demonstrate a carcinoma to be the cause of the bleeding, or the so-called metastasis of the rectal shelf may be the indication that carcinoma higher up in the abdomen is the condition dealt with, and not ulcer. The superficial lymph nodes, especially those behind the sternoclavicular region, should not be forgotten. The pupillary reflex and the ankle and knee jerks may give a definite trend to the diagnosis. In the ulcer suspect local findings in the abdomen are not definite as a rule, however; the location of a tender spot corresponding to the site of the epigastric pain, and perhaps a definite spot of tenderness in the back are often of corroborative value. The presence of a mass, visible peristalsis, splashiness of an atonic or of the distended stomach of retention, a demonstrable mal-position of the splanchnoptotic organ, are signs of great differential value when properly fitted into the clinical picture. Rigidity and enlargement of liver and spleen should always be looked for.

In estimating the value of gastric analysis one is struck by the not infrequent occurrence of acid in the early stages of carcinoma, and the occasional occurrence of achylia in benign ulcer. Frequently the Reigel motor meal, especially when drawn off with the Rehfus tube, fails to show a retention that is readily found by the X ray. Blood in the stomach contents must be given careful thought, and the possibility of trauma and other causes be considered. Fractional analysis has taken a definite place and should be the rule. Lactic acid is not a conclusive sign of carcinoma, but the Boas-Oppler bacillus is a most important sign when present.

X-ray findings made from plates alone, without fluoroscopy have very little value in a majority of cases. They will show clearly the filling defect of a well-advanced carcinoma, often the accessory pocket of a perforating gastric ulcer, and will clearly reveal ptosis, retention, and hourglass deformity. The signs of ulcer of the stomach and

duodenum are, however, often missed or not demonstrable on the fixed plate when they are plainly visualized by the fluoroscopic screen. The roentgenologist who is trained in fluoroscopy can be of the greatest value in the diagnosis of ulcer. Deformities of the duodenal cap, the presence of a niche, the filling of an accessory pocket, or diverticulum are among the positive findings of ulcer, which may or may not be demonstrable on the plate. When it is realized that the Mayo Clinic statistics show a 95 per cent degree of accuracy in the X-ray diagnosis of ulcer, it is clear that the X ray is capable of being considered in that clinic the most valuable single diagnostic sign, and when at that clinic a negative X-ray diagnosis is shown statistically to have the same percentage value of accuracy, its possible usefulness becomes even more clearly apparent. Moreover, the X ray is admittedly the only means by which a differential diagnosis between duodenal and gastric ulcer is possible, for it alone is capable of showing the exact location of the lesion. If a close approximation to this degree of accuracy in X-ray findings is available, the diagnosis of ulcer is robbed of much of its uncertainty. Wherever the X-ray findings are not made by an operator trained in fluoroscopy the value of the roentgenologist's opinion must be rated far below the 95 per cent level.

Complications and later sequelæ of ulcer change the clinical picture. Not infrequently the ulcer patient will have borne with his complaint for years until the added difficulties arising from the perigastritis of a perforating ulcer, the hematemesis or melena of erosion of vessels, or the acute symptoms of perforation bring him to the doctor. In the presence of his insistence upon symptoms of the complications, a story of antecedent chronicity, periodicity, and food relation may be difficult to extract, for memory of these lesser troubles is clouded by the greater insistence of his present trouble. Here a carefully sought history may become of the utmost diagnostic value. Acute perforation is of course an emergency in which hope for life rapidly lessens after the first 12 hours, so that in the presence of this accident there is no time to be wasted in obtaining, by careful questioning, a detailed history of antecedent trouble, and neither time nor a safe opportunity for gastric analysis or X ray. The brief interval, in which action in the form of emergency surgery is demanded, permits only of tentative diagnosis of the cause, with all efforts being focused upon the clinical picture of an acute abdomen and the necessity for early surgical interference. Perigastric peritonitis, the so-called perforating ulcer, gives more time and opportunity for exact diagnosis, for rarely does this type change into acute perforation, with its shock, rapid soiling of the peritoneum, and death, unless relieved by early surgery. In the chronic perforating type an increase in the severity of pain, pain becoming more continuous, made worse perhaps by eating, localized rigidity, increase

in tenderness, a tendency to obtain relief by posture or pressure, the X-ray finding of a deep accessory pocket; these, among other findings, suggest the chronic form of perforation. Vomiting of food eaten the day before, visible peristalsis, change in the type of pain from a post-meal pain to one increased by a full stomach, the finding of a small movable tumor; these suggest pylorospasm, pyloric stricture, retention, and the X-ray picture confirms the diagnosis. Hemorrhage in considerable amount shown in the vomit, hematemesis, or in the stool melena, indicated in the past by history of fainting, with the passage of tarry stools, is important evidence pointing toward the bleeding type of ulcer. Here, however, the clinician must not be led into the error of considering this to be diagnostic of ulcer. These more or less severe hemorrhages are often unassociated with ulcer and are often due to other disease entities. It is true that rarely ulcers are silent as far as symptoms are concerned until the sudden appearance of bleeding gives the first clue which eventually leads to diagnosis, but, as a rule, in the presence of intestinal bleeding we must look to the history and other evidence to determine its probable cause. Not infrequently a gall bladder, with its train of gastric symptoms, will be the only pathology demonstrable at operation. Cirrhosis of the liver, varices within the stomach, the rare hemangioma of the stomach, hemophilia, esophageal bleeding, rectal bleeding, and many other possible causes must be remembered.

The symptom complex of tetany rarely observed as a late sequel of long-standing ulcer is dependent upon a serious degree of retention from pyloric constriction. More commonly this picture is found in the pyloric stenosis of infancy and from pyloric closure, coming on gradually after an operation for ulcer, and very occasionally some of its clinical picture is seen immediately postoperative in the occasional case which develops an acute postoperative retention in the second week after a gastroenterostomy.

In the treatment of ulcer we find a controversy that has been going on for years between the advocates of medical and of surgical treatment. The extremists on either side seem to be somewhat intolerant of the opinions of their opponents. Like most controversies, the facts, when marshaled into debate, seem to prove both contentions. Neither the internist nor the surgeon claims 100 per cent of cures; both, however, claim a percentage of cure approximating from 80 per cent to 90 per cent. In regard to the medical cures the surgical enthusiast says, "How does the internist know his so-called cures were really ulcer? He did not see the ulcer; maybe he cured a functional stomach and thought it was ulcer." Again, the surgeon says, "Most of my cases have been treated by physicians and many by most capable gastroenterologists, yet they come to me finally for

operation after years of suffering, and I cure 80 per cent, benefit a few more, and in only a small percentage does surgery fail to give complete relief."

The medical enthusiast says, "My diagnostic ability is better than the surgeon's. I know that when I diagnose ulcer it is ulcer. I do not need to see or feel it to be sure. My many cures never get to the surgeon, so he knows nothing about them; only the small percentage of ulcer I can not cure by medical means go to him. Seldom does an ulcer-bearing patient die while undergoing medical care; a considerable mortality in the aggregate, though small, in the best surgical hands exists in ulcer-bearing patients operated upon; frequently there come to me for help patients in whom a gastroenterostomy or other surgical effort has failed to give relief. We both lose patients from the emergency of acute perforation; even excision of the ulcer does not always prevent the recurrence of serious hemorrhage. Autopsy findings show quite frequently scars of healed ulcers in people who were never treated for ulcer; the disease is one subject to remission, to spontaneous cure, and to cure after medical care. Many of the surgeon's cures are due to the period of rest and reduction of acids brought about by operation and gastroenterostomy. Medical care will do the same without the risk of the permanent change that operation brings in the physiology of the stomach and duodenum. Not infrequently I see patients with enteritis due to the changes following a gastroenterostomy. A medical failure can be followed by repetition of medical care unless a serious complication, such as acute perforation, continued hemorrhage, the perigastritis of chronic perforation, or retention and pyloric stenosis demand surgical interference. A surgical failure is a pitiful thing; the poor patient in whom surgery has failed must return to medicine with the added handicap of an altered anatomy, or he must accept the very considerable danger of a second operative interference, such as can be successfully carried out by only a few of the most able surgeons."

In a study of these conflicting ideas it is obvious that the medical enthusiast considers some of his ulcer-bearing patients to be in need of surgery, notably the complicated and those resistant to medical management. The surgeon, however, feels that not infrequently too long a period in a given case has been allowed to medical management, so that the patient comes to him with these more dangerous late sequelæ and complications, in whom an earlier operative interference would have been better. If it is admitted that the claims of the surgeon and the claims of the internist, based in both instances on ample and quite reliable data, are in the main true, instead of an unfortunate controversy which lines up the profession on opposing

sides, we have a most fortunate condition of affairs. If medical care offers practically the same percentage of cure, especially in the earlier months or years, we have two methods of treatment, either of which may be selected for the uncomplicated ulcer-bearing patient.

The treatment of ulcer, therefore, may be medical alone or surgical alone. It may be medical, followed by surgical, and in a few instances it may be surgical followed by a return to the medical. Surgery is in most instances elective; very rarely is it of immediate necessity, occasionally it is urgent or imperatively necessary.

If we define acute ulcer as one which has produced symptoms for less than two months, it may be said that except in the very unlikely accident of perforation the treatment of acute ulcer is always medical. It is in the chronic ulcer that the divergence of opinion exists. Here the diagnosis of ulcer and the probable presence or absence of complications does not always give a basis upon which to rest a decision: The economic situation of the patient, the type of medical management available to him, and the ability of the surgeon to whom he can be referred are factors of prime importance in the decision. Medical management requires rest in bed, preferably in a hospital bed with careful nursing and daily expert medical supervision, for a period of weeks, perhaps six or more, followed by a carefully restricted and well-controlled diet and daily medication for several months or a year, and all this with the understanding that even this long course may end in the necessity for its repetition or the necessity for surgery. The patient of moderate means, upon whose ability to earn a living his family depends, must face this outlook with a considerable degree of hesitation when the surgeon offers him as good a percentage chance for relief from an operation that will allow him to return to his work at the end of three to four weeks, with a short circuit in his stomach, which mechanically lessens the necessity for a long period of medication and diet control. The decision between medicine or surgery therefore, not infrequently, must be based on diagnosis plus economics and environment rather than upon the diagnosis alone.

If the patient is willing and economically able to give to his care the long period of time necessary to best insure success from medical treatment, and if the possibility of failure is clearly shown him, surgery can often legitimately be placed in a deferred class unless or until complications arise that demand its use.

Medical management is based on two principles: First, the fixation of the acids in the stomach by food and by alkalies, so that its corrosive effect upon the ulcer is lessened or removed. Second, the ingestion of such foods and the institution of such medical care as will best tend to reduce the secretion of acid in the stomach and re-

duce excessive motility. It is the purpose of these two major principles to give physiological rest to the ulcer area in a way not inconsistent with the proper maintenance of body nutrition, so that healing may occur. To these two major principles are added the removal of infected foci, tonsils, teeth, etc., and the treatment of special symptoms when present—pain, vomiting, hemorrhage, anemia, malnutrition. The details of medical treatment are available in standard books and especially in the writings of Sippy, whose success in the medical management of ulcer has led him to restrict his indication for surgical interference to the following:

1. Reasonable suspicion of carcinoma.
2. Acute perforation.
3. High-grade pyloric obstruction failing to yield to medical treatment.
4. Perigastric abscess.
5. Hourglass stomach (some forms).
6. Hemorrhage (some forms).
7. Removal of foci of infection.
8. To remove perigastric adhesions (very rarely).
9. Very rarely special types of ulcer excision or gastroenterostomy may be indicated, if an expert surgeon is available.

The surgeon who endeavors to cure the ulcer-bearing patients must have capable assistance in a well-equipped hospital and should accept for operation only those cases in which the diagnosis has been made after exhaustive clinical study. He must be capable of performing the many difficult operations, any one of which or a combination of which may be indicated when the abdomen is opened. Even when the diagnosis of ulcer seems certain by clinical, laboratory, and X-ray positive findings, an exploration may fail, in a small percentage of cases, to reveal the presence of an ulcer. Instead there may be a cholecystitis with or without stones, a chronic appendix, a hepatitis, a pancreatitis, a duodenitis, or no recognizable pathology whatsoever. Every surgical attack upon an ulcer then becomes primarily an exploration, and for the success of this first step a knowledge of surgical pathology and an ability to recognize it by sight and touch when present is essential. The operative procedures indicated, once the abdomen is open, vary with the findings and vary according to the judgment and experience of the particular surgeon. Definite principles of surgery govern and the application of one or more may be necessary in an individual case. In addition to the ulcer other pathology in need of correction is not infrequently found, such as a diseased gall bladder or appendix, and it is not unusual for these conditions to demand and receive correction along with the operative procedure directed at the ulcer itself.

While posterior gastroenterostomy is by far the most frequently employed of all surgical procedures which aim at cure of ulcer, the surgeon who is most experienced in handling these cases has found that this operation can not be the routine in every case. Five principles govern him in his attack, and in line with the application of these principles a combination of more than one operative procedure may be indicated. Without naming all the types of operation that are used in the endeavor to cure ulcer, they may be grouped anatomically under their governing principles, as follows:

1. Exploration.
2. Removal of the ulcer-bearing area:
 - Cauterization and suture.
 - Cautery, knife excision, and suture.
 - Knife excision and suture.
 - Sphincterectomy.
 - Duodenectomy.
 - Pylorectomy.
 - Midgastric resection.
 - Subtotal gastrectomy—Billroth, Polya, Polya-Balfour, etc.
 - Gastrectomy.
3. Establishment of drainage:
 - Gastroenterostomy; posterior, anterior, or in Y, with jejuno-jejunosomy.
 - Pyloroplasty—Finney, Halstead, etc.
 - Gastroduodenostomy.
4. Plastic corrections:
 - Gastroplication, gastric fixation, correction of hour-glass deformity.
5. Correction of accompanying pathology:
 - Cholecystectomy, appendectomy, etc.

Excision of the early duodenal ulcer without gastroenterostomy not infrequently results in cure. In the bleeding type of ulcer increasing experience seems to stress the importance of excision with gastroenterostomy or, if excision is impracticable, ligation of vessels outside the ulcer area. The more extensive excisions of the stomach itself carry a mortality much higher than gastroenterostomy, yet the not infrequent finding of beginning carcinoma in the calloused or large ulcer of the stomach makes the application of these technically more difficult procedures a necessity in properly selected cases, especially in gastric ulcer. For the average duodenal ulcer gastroenterostomy alone is the more commonly used procedure.

When the operation is one of necessity, in the presence of acute perforation, the severe anemia of persistent hemorrhage, or the serious malnutrition of retention not amenable to medical manage-

ment, the surgeon is dealing with a patient in whom one or more of the above-named procedures may be indicated, but the application of the ideal surgical procedure must often not be attempted because of the serious condition of the patient. In these seriously ill persons he must be content with the most rapid and the simplest procedure that will best meet the vital indication and defer to a later time and to a secondary operation the procedure that aims at cure of the ulcer or of the complicating pathology. In the markedly anemic, transfusion sometimes tides the patient over so that he may get a start toward medical or surgical relief.

Of the end results of treatment it is not easy to judge. The known tendency of gastric ulcer to heal, as shown by findings of scars of healed ulcer at autopsy, the known tendency of the symptoms to abate and disappear for longer or shorter intervals, and the regularity with which physiologic rest of the stomach, combined with reduction in acidity causes a disappearance of symptoms, makes it necessary to judge a patient cured, not by the immediate postmanagement condition, but by the course over a period of at least one year.

The advocates of medical management claim a percentage of cures practically equal to the percentage claimed by the advocates of surgical management. The more optimistic of the gastroenterologists place the medical cure of these cases at or above the figure 95 per cent. The more optimistic of the surgeons place their figures for surgical cure at or above 88 per cent. The medical figures, however, are based upon acute as well as chronic ulcers and the total of such cases are diagnosed clinically with at least a 5 per cent error in diagnosis. The surgical figures are on the other hand based upon cases in which the ulcer was seen or felt at operation, and moreover the surgical group tends to contain the late and complicated cases, so that of the two claims surgery seems to offer a slightly better assurance than does medicine.

When an ulcer-bearing patient has tried medicine without cure there is almost always the hope of surgery left to him, with an excellent opportunity for relief, provided he has not waited too long. He who fails of relief from surgery is less fortunate. Surgery added to surgery becomes a matter of extreme difficulty in such a case.

What is the cause of failure to cure? Can the number of failures be lessened?

Moynihan gives the chief reasons for failure after surgery as follows:

1. The performance of gastroenterostomy in the absence of a lesion intrinsic to the stomach or duodenum.
2. Faulty technic, which often gives rise to the symptoms of vicious circle, the result of obstruction of one of the jejunal links, especially

the distal one, or the result of too small a stoma or too long a jejunal loop.

3. Lack of thoroughness in operating, such as neglecting to remove a diseased gall bladder or an appendix at the time of an otherwise successful operation, or to deal directly with an ulcer-bearing area when circumstances warrant it.

4. Formation of a new ulcer in the stomach or duodenum at or beyond the stoma and reactivation of the partially healed or unhealed ulcer or carcinomatous changes in a gastric ulcer not removed at the primary operation. In these cases such sequelæ give rise essentially to painful symptoms at variable periods after operation, in which the complaint is often identical to the original. Similar distress may be provoked by extensive adhesions at the pylorus or by those involving the stomach and anterior abdominal wall, the result of repeated operations or undue manipulations.

Some causes of failure after medical and surgical management are thus seen to be alike, such as reactivation of an unhealed or partially healed ulcer, formation of a new ulcer in the stomach or duodenum, error in original diagnosis. Others, notably the formation of a new ulcer beyond the stoma, the so-called gastrojejunal ulcer, and the distress provoked by excessive postoperative adhesions, are possible only after surgical treatment. Error in diagnosis, faulty technic, lack of thoroughness, either medical or surgical, come in the field of prevention by improved methods and better control of the patient. The prevention of new-formed ulceration and reactivation of ulcer is to be met by prolonged postmanagement, dietary control, and alkali therapy, and the removal of infected foci, on the theory that these foci are etiological factors of importance in the causation or reactivation of ulcer. The prevention of carcinomatous change in a gastric ulcer is best met by the application of excision or resection of the ulcer area at the first operation.

Diagnosis of the cause of postoperative failure is often difficult, at times impossible. The reappearance of pain referred to a lower level or to the left side is suggestive of gastrojejunal ulcer. The X-ray findings of gastrojejunal ulcer may be positive. Faulty technic may rarely be suggested by the X-ray findings, such as stoma too high, too far to the right, or too small. Exploration as a rule becomes the final method of determination in most cases.

In this contingency the surgeon often finds himself in the presence of a most complicated situation, offering technical difficulties of a formidable nature. Adhesions to the abdominal wall delay exploration. Adhesions to liver, gall bladder, matting together of colon, stomach, and omentum about the stoma are difficult to remove and delay his advance. Previously uncorrected complicating pathology of gall bladder or other organs has become more difficult of cor-

rection. The patient not infrequently is in poor condition and the corrective procedures not infrequently are such as to require a great rapidity in technical handling, with the probability of success only in the hands of surgeons of the highest technical skill. A list of the procedures successfully carried out in the case of an emaciated man 69 years of age will illustrate the not unusual complexity of operative performance necessary in these cases: Dissection of extensive adhesions, excision of gastrojejunal ulcer by cutting off old gastroenterostomy, closure of duodenal diverticulum, cholecystectomy, and pyloroplasty.

In this survey of the problems of ulcer certain fundamentals stand forth of value to the naval surgeon. The condition is more apt to demand treatment in the third and fourth decades of life than in the second. The disease is apt to run a course of more than four years before surgery is resorted to. Very seldom is immediate surgery urgent and imperatively necessary. Periods of remission alternate with periods of freedom from symptoms. Both medical and surgical treatment require considerable periods of time, a high degree of medical and surgical skill, and considerable special experience to bring about a high percentage of cure. Expert radiography and especially expert fluoroscopy is a most valuable aid to accuracy in diagnosis. The decision between medical and surgical management depends not alone upon accuracy in differentiation of ulcer from other abdominal conditions, but also upon factors in the patient's environment, such as his ability to give up a long time to treatment and upon the degree of surgical skill available. The opportunity for permanency in cure is increased if the patient continues for many months on a carefully controlled diet.

In the Navy the element of time consumed in treatment and expense to the patient need not influence the decision as to treatment, for practically no limit is set upon the time of treatment that may be given to any patient, and no loss of pay results while in the hospital. The matter of age becomes of great importance in the probable incidence of ulcer. Among patients aboard ship and at foreign stations the proportion beyond the age of 25 to 30 years is very small. The active service is made up of men whose age averages perhaps 20 years. The very small number over 30 years and up to 64 are found almost exclusively in the chief petty officer and officer groups. This factor of age reduces the probable incidence of ulcer at sea and at foreign shore stations to the vanishing point. In this environment the naval surgeon when confronted by patients with "stomach complaint" is, in the overwhelming majority of instances, dealing with appendicitis or with an intestinal condition due to poisoning by food or to the gastric disorders of dietary indiscretions not uncommon in robust young men. Occasionally he may have a neurasthenic, a

functional disorder, rarely a splachnoptosis or nephrolithiasis, and not infrequently chronic constipation. If his patient belongs in the older age group he must consider the more complicated possibilities of ulcer, carcinoma, tabes, angina, cholelithiasis. Surgical treatment at sea or at a foreign station should perhaps be strictly limited to the emergency of acute perforation and medical treatment to such a course as will best aid him in correct diagnosis, and best fit his patient for transfer to a hospital ship or to a naval hospital. Diagnostic ability in the upper abdomen can not be very accurate away from the environment of the hospital, no matter how capable the naval surgeon may be in his history taking and physical examination, for he must depend on laboratory procedures somewhat below the standard possible in hospitals, and if the services of a roentgenologist are by chance available, he is often of an unknown degree of dependability.

On board the hospital ship and in the naval hospital proper evaluation of the accuracy of X-ray and laboratory aids is more certain, because there many more patients in the older-age group, with symptoms pointing to the upper abdomen, and a more specialized medical personnel are available. The naval hospital is more likely than the hospital ship to receive patients in the older-age groups. In these hospitals are to be found the retired officer or man, and the patient received from the Veterans' Bureau, men whose average age is now 30 years or more. In the naval hospital the incidence of ulcer, cancer, cholecystitis, tabes, angina, and other disease entities responsible for the production of symptoms referable to the upper abdomen, is considerable and the postoperative stomach, especially in the veteran group, occurs not infrequently. There the differentiation between the neurotic or psychasthenic patient with stomach trouble and the patient with definite pathology is a daily problem of the utmost professional interest. These cases challenge the abilities of the naval surgeon; they necessitate a sharpening of his clinical acumen and diagnostic ability; they present definite problems in management, both medical and surgical. To the roentgenologist they present the necessity for accurate technic and place squarely before him the need for real ability in fluroscopy of the gastrointestinal tract.

CONCLUSIONS.

1. Juxtapyloric ulcer is a rare disease and especially rare in the young adult of the active naval service.
2. Its recognition by purely clinical means is difficult in perhaps 75 per cent of the cases.
3. Fluroscopic findings obtained from a roentgenologist skilled in the examination of the upper intestinal tract may be of greater value

in the diagnosis of ulcer than any other single method, and it is the only method, except exploration, that will localize the lesion.

4. Ulcer often presents a clinical picture closely simulated by many other organic conditions, either intrinsic or extrinsic to the upper intestinal canal, and by many general conditions and diseases, including neurasthenia and psychasthenia as well as reflexes from other organs.

5. Among the officer and chief petty officer personnel, both active and retired, who are in an older age group than the young adult of the active service, ulcer and its complications is by no means unknown.

5. Among the veteran group of patients the naval surgeon encounters a fair number of ulcer-bearing patients.

7. The accuracy of diagnosis and type of treatment needed for ulcer varies considerably with the economic situation of the patient and with the type of medical and surgical care available, both in civil and in naval practice.

8. Ulcer is a borderline disease—the dentist, the nose and throat department, the laboratory, the roentgenologist, the medical clinician, and the surgeon are all needed both for the diagnosis and treatment of the juxtapyloric ulcer.

9. Group medicine, the opinions of several doctors, each specialized in different fields, properly coordinated by one of the group, offers the ulcer patient his best opportunity for proper care and the best hope for ultimate relief.

10. Surgical and medical management are not two separate roads, upon one or the other of which the ulcer patient must choose to travel, but rather two sides of a single road, upon the broad and solid surface of which he may readily travel, now on one side, again on the other, at times even on both sides, with the assurance that it is but one road leading definitely toward a cure.

SAMOAN MEDICINES AND PRACTICES.

By D. HUNT, Lieutenant Commander, Medical Corps, United States Navy.

There are many people whose hereditary instincts and customs preclude them from adopting without much doubt any new ideas and inventions of the scientific and mechanical world. They resemble in a large degree the people of several generations ago who were slaves of precedent. They remain with their back to the sun and defy change and invite the ridicule of the later generations. Not alone in the past but in the present there are certain divisions of nations, classed as part of the civilized world, which will not adopt

the ideas, views, practices, and inventions which are at variance with their own long-cherished ideas, practices, and views. They worship the accomplishment of the past as the height of perfection. Take, for instance, the large peasant class of Europe and many of the rural people of the United States who resist with much stubbornness any change.

It is so with the Samoan people who, though not classed as a part of the enlightened and civilized people of the world, have many excellent characteristic traits not always to be found in the long-established civilized countries. The Samoans are a very conservative race, adhering strongly to their customs and ideas handed down to them by their forbears. Yet, notwithstanding this trait, usually the Samoan is ready to accept and applaud advanced ideas and even to adopt them, but there is an inward dread of an unpleasant visitation of the spirit of one of their departed kin who, in their opinion, may be angered at the innovation and departure from their old-time custom and practice. A few days ago I heard of a very intelligent Samoan remarking that members of his family could not submit to either a major or minor operation by a white surgeon because some time ago a member of the family had died under an operation. The then living matai, or head of the family, had expressed a wish that in the future no person belonging to his family must permit the knife of a surgeon to touch their body. Any disobedience of this instruction will call forth wrath of the departed spirit and especially that of the one who died under the operation.

A few generations ago surgery was fearlessly practiced by Samoan doctors; legs were amputated, splints were applied to fractures, operations upon fractured skulls were even performed. There lives in the village of Fitiuta a Samoan, who is mentally and physically above the average Samoan of his age, who had about two-thirds of his left parietal bone removed by a Samoan doctor in 1867, at the time of the eruption of the submarine volcano near Olosega. To-day the surgery performed by Samoan doctors is limited to multiple incisions in the case of abscesses or filarial swellings. The instruments used are sharks' teeth, shells, or sharpened pieces of bone. Nearly all of these cases are finally brought to the hospital except those that result in death from infection or from hemorrhage due to the cutting of a blood vessel.

Circumcision is performed upon all Samoan boys when they reach the age of 10 or 12 years. Twenty-five years ago circumcising was a special trade. The operation consisted merely of making a dorsal incision with a sharpened coconut shell, though to-day the safety razor blade is used. No sutures were taken. Most of the circumcisions are now performed at the Samoan Hospital or by one of the native hospital corpsmen.

Frequent bathing in salt water has always been used by the Samoans for open wounds, sores, and ulcers.

Lomilomi, or massage, is universal in Samoa. Its practice is not limited to any special trade, though all Samoan doctors use it in connection with other treatment. In massaging the sick, the lomilomi operator usually massages only at the site of the pain. This is kept up until the patient can bear it no longer. Deaths occur each year from lomilomi, especially among those who are suffering from appendicitis, intestinal obstruction, or pelvic abscess.

Insanity is very rare; in fact, there does not exist in American Samoa a case that is a menace to the public. Some months ago a case of catatonic præcox was admitted to the hospital, and after being kept there about a week his family requested that they be allowed to take him home. His removal was agreed to after his condition and the care that would be necessary in his case had been thoroughly explained to the family. The following day word was received of his sudden death. It is believed that all cases of insanity are treated in the same manner.

Native first aid is practiced in all villages. When anyone becomes sick his relatives immediately administer a dose of castor oil or magnesium sulphate, or in the absence of these a Samoan purgative, and wrap the sick person in several tapa cloths until it is decided by a family council whether the sick person is to be taken to a Samoan doctor or to the hospital.

While the Samoan is willing to admit the superior wisdom and advanced skill of the medical officer, he finds it difficult to depart at all times from the means and drugs, howsoever crude and nauseous, derived from accomplishments and information narrated to him by his predecessors. He can not eliminate from his mind that innate feeling that the medicine, once having (by a miracle or by accident or without any action on the system itself) caused a reported cure, should not be able to do similar service in other cases.

It may be stated without any exaggeration that in almost every family there is one person who is intrusted with some special secret remedy for a certain specific case.

The trait I have mentioned and the knowledge among the relatives of a sick person of one of these numerous persons charged with medical secrets, create a serious barrier to the work of the medical officer, although he is recognized by the Samoan as possessing superior knowledge and skill. The Samoan will submit to treatment, but if a cure is not speedily effected the relatives of the Samoan patient prevail upon the sick person to resort to some Samoan remedy, even concurrently with the treatment from the medical officer. This frequently proves fatal to the patient and the white doctor is blamed

for being unable to overcome the malady. This is a most unfortunate and even unpleasant situation, especially when medical officers are exercising all their knowledge, skill, and patience to bring relief to any suffering Samoan.

The naval medical officers with their assistants for more than 22 years have been doing excellent work among the Samoans. The Medical Department of the Navy has been a stronger agent in reconciling the Samoans to the United States than any other department of the Government. The Samoans know it, they themselves speak in high praise of this department. Yet, with all their fortunate associations with the hospital and dispensaries and the officials, many, probably a majority, of the Samoans believe that their own crude drugs and harsh medical treatment are more efficacious than the purer manufactured drugs supplied to them through the Medical Department and the gentler scientific treatment by the medical officers. In fact, they insist that in some tropical diseases, notably elephantiasis, trained medical men have not been able to supply the medicine to effect cures, and their belief is strong in the value of their own drugs, the knowledge concerning which is a secret handed down from generation to generation among the descendants of the person originally discovering the supposed palliative effect of the drug.

It has been said that nearly every family has among its members one person who is in possession of a secret concerning a remedy for some specific ailment. In the majority of cases the secret remedies used are harmless, though a few use poisonous herbs which are the cause of many deaths. When the patient does not improve, which is generally the case, an excuse is offered that the sickness is not caused by the particular spirit or devil for which he has a remedy.

The possession of secret remedies proves in a number of instances a lucrative one. While the person treating a Samoan patient makes no demand for payment, yet the party when cured, or his relatives if the patient be dead, feels that compensation must be given, and presents of a Samoan nature are liberally bestowed in recognition of the services of the Samoan operator.

Some of the Samoan drugs act with unnecessary violence on the human system when taken internally; some have a real palliative effect. There are oils and juices extracted from the bark, roots, or leaves of plants which, when applied externally, bring temporary relief. An investigation and analysis of the Samoan medicines as used by the Samoans would be of interest.

Many of the holders of Samoan medical secrets make no profession of their knowledge; they do no advertising. The information of such knowledge is obtained from some other person. Such a one is usually to be found among the attendants of a sick person or among the numerous parties of visitors who take baskets of food

to the house where the sick person dwells, ostensibly for him but really to be partaken of by the hale and hearty members of the family and other visitors. Some one will mention that a certain person has a drug or has some means of treatment which will effect a cure, and then the services of the person are sought.

There are others claiming to possess medical secrets who make an open profession of their knowledge, assumed or otherwise. These may safely be classed as "devil" doctors. They have not the knowledge and skill they profess to have, but through influence they have obtained a reputation which is the means of enriching themselves and their coworkers. These men usually profess to have some supernatural powers and by incantations and exorcisms prevail upon the unfortunate sick.

A few of the practices of Samoan "devil" doctors that have come to my attention are described to show various methods of incantations and exorcisms that are practiced. They are used in conjunction with herbs or without them. The *modus operandi* in one case is for the "devil" doctor to enter the house of the sick person with a coconut shell containing smoking ashes; he passes around the sick person blowing the smoke toward the patient and uttering a few mumbled words. Another method consists in touching the supposedly sick part or the sick person with a coconut palm and making a circular motion with the palm. This circular motion is increased by one for each time the patient is treated. The most popular treatment is called "chasing the devil." A dose of some poison is first administered, usually the sap of *Barringtonia speciosa*. About the time the effect of the poison is to be noticed the "devil" doctor enters with four assistants who have a sheet or similar cloth, which is spread out and held about 2 feet above the floor. The "devil" doctor beats the patient with his hands until the occurrence of convulsions. The first cockroach, moth, or insect that falls into the sheet is supposed to be the devil. The sheet is immediately closed over the supposed devil, which is taken outside and killed. The convulsions of the patient are caused by the devil trying to get out. If the patient recovers from the poison, he is supposed to be rid of this particular devil. In event of a fatal outcome the "devil" doctor is ready with the excuse that death could not have been caused by a devil, because the devil was captured and destroyed, but was punishment by the Almighty God for theft. Usually all the thefts that had occurred in the village during the past few weeks are blamed on the dead one.

Post-mortem examinations are still practiced to a certain extent though not as often as a few years ago. The post-mortem is only performed by members of the family of the deceased. They look for anything abnormal. If a tumor is found, it is cut out and burned. By doing this they think that they have destroyed the devil and thus

prevented any other members of the family becoming afflicted with that particular devil.

There are a few natives who are endowed with a personal magnetism and who also are in possession of a few secret herbs used medicinally. They make no exhibition of their powers; neither do they indulge in any supposed assistance from any invisible identity or profess to have any extraordinary powers. These form quite a distinct class from those previously mentioned. Some of the persons who have this personal magnetism possess also a crude conception of anatomy, and this enables them to exercise their natural power with success. They soon gain a reputation, and people go to them from all parts of the islands for relief. Many white men who have resided for a long time in the Tropics, among them missionaries, go to these Samoan doctors for treatment. In addition to their medicinal herbs and massage they use bloodletting to allay inflammation and burning as a counterirritant.

A list of the majority of Samoan herbs, plants, etc., that are used by the Samoans has been obtained. Much difficulty was experienced in securing it, and in several instances the Samoan use would not be told for fear of a visitation of the spirit of the departed one who revealed the secret to them. They are as follows:

A'atasi (*Cardamine sarmentosa*). Used in treating gonorrhœa.

Afia (*Ascarina lanceolata*?). Use not known.

Aloalo (*Premna taitensis*?). Use not known.

Aloalotai (*Clerodendrum inerme*). Leaves are used for fevers.

Anaoso (*Guilandina crista*). Used in fevers.

Aōa (*Ficus prolixa*). Use not known. The latex is used.

'Ava (*Piper methysticum*). The root is used in gonorrhœa.

'Ava'avaaitu (*Piper betle*). The stem and leaves are used. The stem is used as a narcotic.

Fetau (*Calophyllum inophyllum*). The oil extracted from the seeds is used in rheumatism.

Fiafiātuli (*Portulaca quadrifida*). Use not known.

Fuefuetai (*Ipopoea congesta*). The root is used as a cathartic.

Fu'efu'e (see illustration). The leaves are used in conjunctivitis.

Futu (*Barringtonia speciosa*). The sap from the tree is used for abdominal distress. It is used by "devil" doctors. Three deaths from this poison have occurred during the past three months.

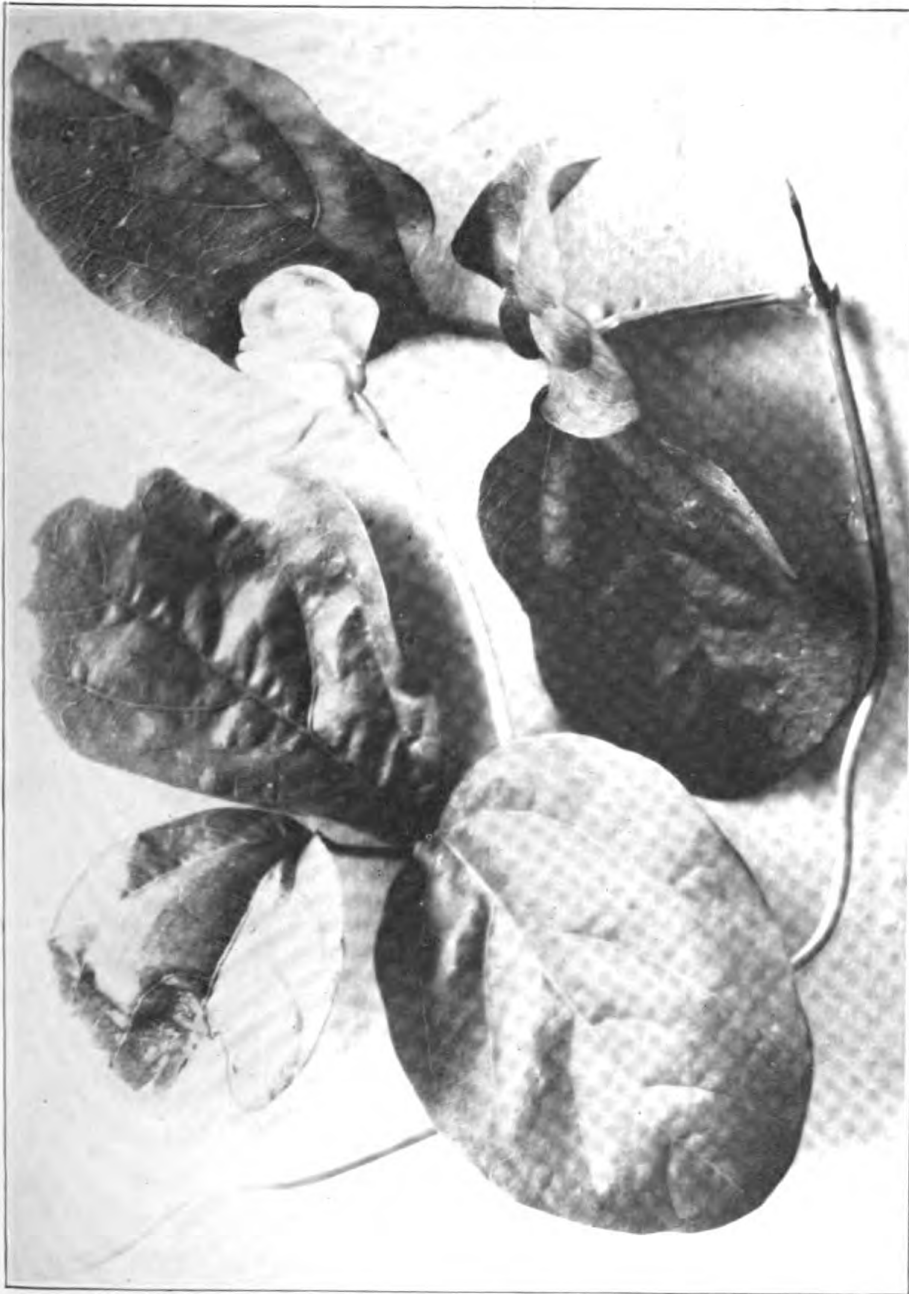
Gatae (*Erythrina indica*). The juice from the leaf stem is used for a sty on the eyelid. The leaves are used to allay inflammation.

Ifi (*Bocoa edulis*). The bark is used.

Lama (*Aleurites moluccana*). Nuts are used as a purgative.

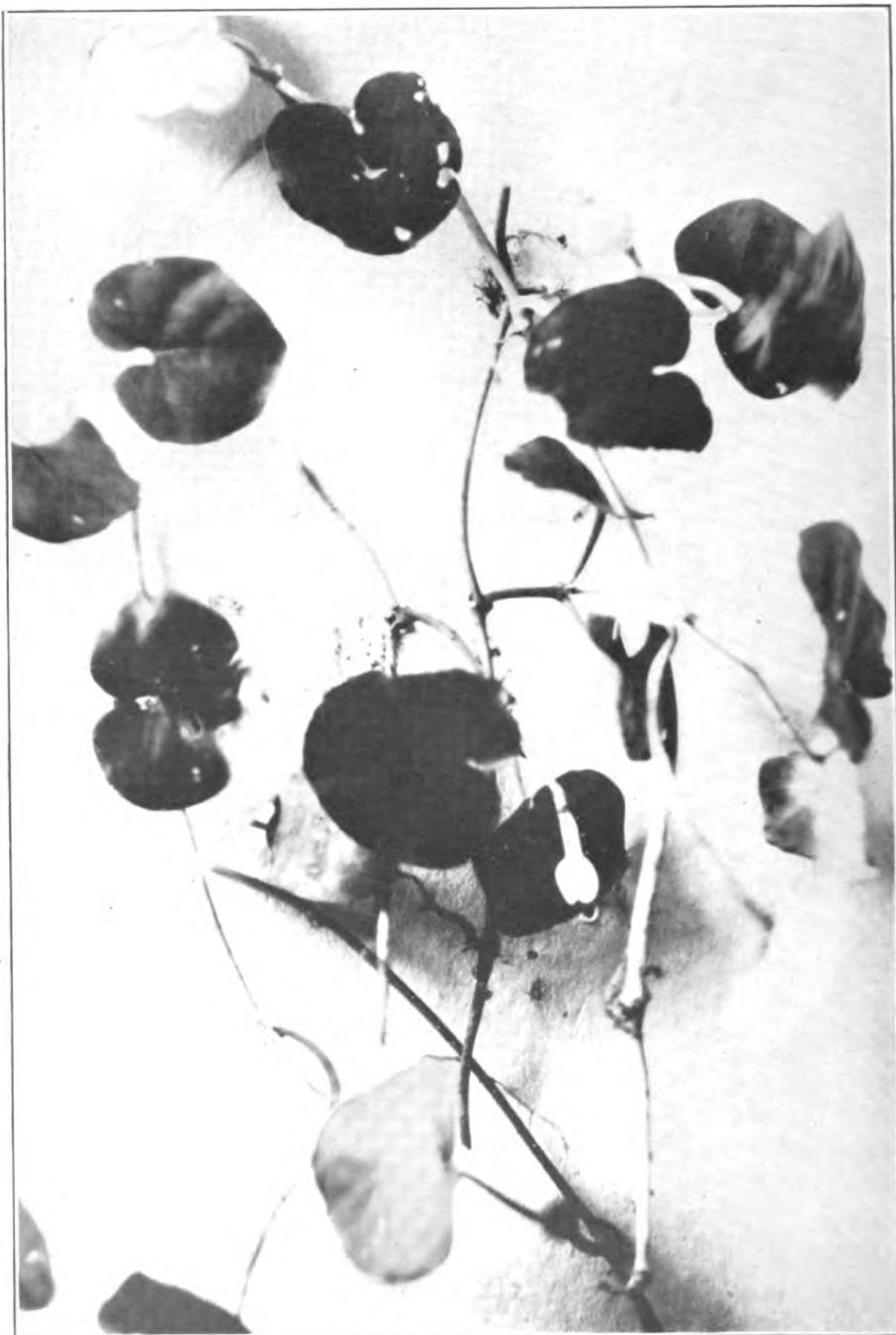
Lamapapālagi (*Ricinis communis*). Use not known. It is used for other purposes than as a laxative in the form of the oil.

Laumafatifati (*Cinchonacea* ?). Use not known.



150—1

Fu'efu'e (actual size).



150—2

Togo or Vivao (actual size).

Laumafatifikisina (*Geniostoma Eupestris* ?). Use not known.

Laugapāpā (*Asplenium nidus*). Used to allay pain in the stomach.

Lautalotalo or Lautamatama (*Crinum asiaticum*). Used as an emetic.

Le'ile'i (see illustration). Use not known.

Limu (moss that grows on the breadfruit tree). Used in fish poisoning. Also used locally in yaws.

Matamataaitu (*Carinta herbacea*). Use not known.

Matamatāmoso (*Abrus abrus*). Root and seeds are used.

Mautofu (*Urena lobata*). The leaves are used locally in filarial swellings.

Ma'u'utoga (*Commelina nudiflora*). Use not known.

Namulega (*Vitex trifolia*). Seeds are used as a tonic. The leaves are used for fevers in babies and has been the cause of many deaths.

Niutolo, a very drastic purgative. Hot rocks are dropped into coconut cream and the oil is collected from the top.

Nonu (*Morinda citrifolia*). The leaves are used in rheumatism and filarial swellings.

Nonufi'afi'a (*Caryophyllus malaccensis*). Used for upset stomach, coated tongue, or thrush. The leaf is chewed.

Olaolasini or Fauuta (*Mussaenda frondosa*). The roots and leaves are used in filariasis.

Ogogo (*Fleurya cordata*). The leaves are used.

Pulatu (*Herpetica alata*). The leaves are used for ringworm.

Pu'a (*Hernandia peltata*). The juice from the bark is used for coughs.

Puāvia (*Jatropha curcas*). The juice is used in treating yaws.

Salato (*Laportea harveyi* ?). Use not known. The leaf will produce a severe erythema upon touching any part of the body.

Seasea (*Eugenia amicornum*). The juice from the bark is used as an emetic. Also used in treating coughs.

Tanetane (*Nothopanax fruticosum*). The root and bark are used.

Teva (*Amorphophallus* ?). Is used in treating conjunctivitis. The root is poisonous.

Togo or vivao (see illustration). Crushed berries used locally to abort boils.

Togovao (*Dodonaea viscosa*). The leaves are used for fevers.

Tono (*Centella asiatica*). The leaves are used.

Tupe (*Lens phaseoloides*). Used as an emetic.

Vaisalo, a mixture of arrowroot and coconut that is fed invalids.

There is only one way to prevent the Samoans preferring their own method of medical treatment to that offered by the medical officers of the Government and that is by gradual education of the people. This is being done by circulars that are being distributed

to each family and published in the Government paper. A pamphlet on hygiene is used in each of the public schools. Every child in American Samoa of school age is required to attend school. Talks are given each month in every village by sanitary inspectors. Every effort is being made to eradicate such endemic diseases as yaws and hookworm.

It is now over 90 years since the various Christian denominations first commenced work among the Samoans. The original conversion of the Samoans into Christianity was effected without much difficulty. They exhibited a ready spirit to adopt it. At the present time many of the old superstitions survive with a number of Christian adherents. In recent years in Tutuila people have been known to take offerings to one or more of their heathen gods. There exists in a family on the island of Ofu a house god, supposed to represent the spirit of one of their ancestors, that is still worshiped. The reincarnation of the departed spirit in some form of animal or insect life is still believed in by some. The Samoans try to keep this secret among themselves lest the representative of the mission stationed with them should be displeased. The many years of education by the missionaries have caused them to fear ridicule when it is discovered they have relied on some of their old superstitions. It will be so with the gradual education of the people to the better methods of medical treatment. The London Missionary Society have teachers and pastors stationed in almost every village in Samoa. These pastors and teachers have undergone many years of training before they are permitted to take charge of the spiritual welfare of the people under them. The Samoans are anxious to have well trained and efficient pastors among them. Similar arguments are being urged in regard to their physical welfare. They can be trained to discard their untrained so-called medical men and to adopt medical treatment at the hands of the well-trained medical officers who are freely administering all help in their power. But this will take time. The people can not be forced to make the change—it must be effected gradually and this, it is gratifying to state, is being done.

DEFORMITIES OF THE NOSE.

By F. E. Locy, Lieutenant, Medical Corps, United States Navy.

Deformities of the nose, both hereditary and acquired, often militate against the patient's peace of mind and in marked cases lessen his economic value to himself and thus to the community. Many of these conditions can be either corrected or improved by surgical procedures. Complete restoration of the nose, while not frequently



Fig. 1.—Hooked nose, hereditary type.

Fig. 2.—After operation.



Fig. 3.—Humped nose, acquired type.
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Fig. 4.—After operation.



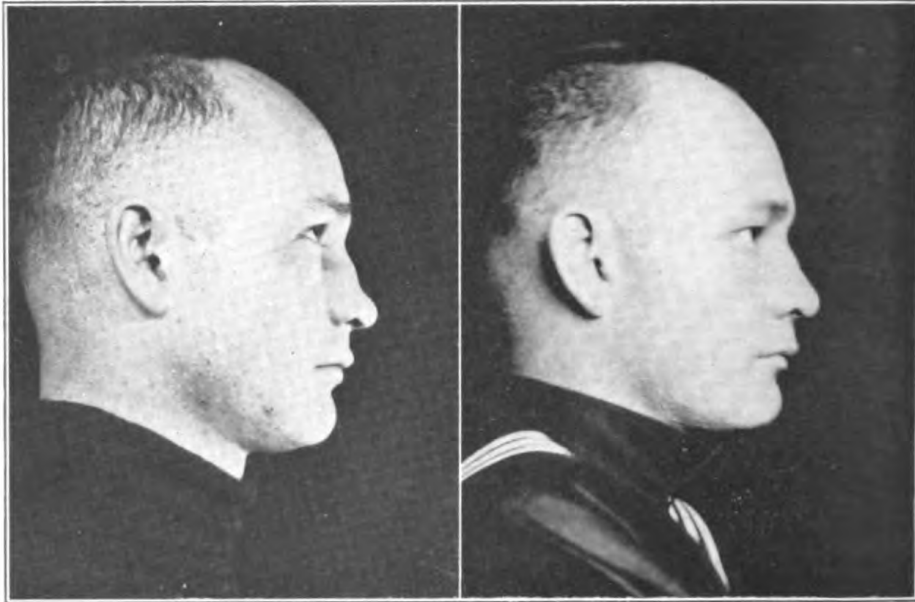


Fig. 5.—Before operation.

Fig. 6.—After operation.

Depression of nose corrected by a cartilage transplant.



Fig. 7.—Deviation of nose.

Fig. 8.—Plaster cast in place.

Fig. 9.—Final result.

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found necessary in this day, has been done since the earliest historic times. In ancient and medieval times noses were frequently cut off as a form of punishment and during fights and battles when men were in close personal combat with swords and knives. Of course, disease, as in the present day, furnished its quota of cases. Thus the plastic surgeon of ancient times was furnished with much material for the practice of rhinoplasty.

At the present time the method of complete restoration of the nose is practically the same as was first described by Taliocozzi in his book on plastic surgery published in Venice in 1597 A. D., wherein a pedicle flap was transplanted from the upper arm. Much more commonly seen in our day are the less marked deformities such as hump nose, saddle nose, and lateral deviations of the nose. The hump nose may be either congenital or acquired. The large hooked or hump nose is a racial characteristic of the Semetic races, but may be acquired from fracture or repeated trauma.

In Figure I is shown a congenital type of hooked nose. This man, a Veteran Bureau patient, complained that his large nose made him the object of the jokes of his acquaintances and was a frequent source of embarrassment to him. A submucous resection was done on September 5, 1922, and on October 12, at his request, a reduction of the hump was attempted. An incision was made about 2 centimeters up inside the nose on the lateral and anterior wall. This incision was made about 1 centimeter long and carried through to a point just below the skin. A sharp Freer's submucous elevator was inserted and pushed upward between the skin and the bridge of the nose. The skin and soft tissues were elevated over the bridge as much as possible and a Ballenger's reverse chisel was introduced and a large portion of the hump scraped off and removed through the incision. The wound was not sutured. Swelling and redness appeared over the bridge of the nose several days after the operation, and the wound in the nose was reopened and pus expressed. Pus drained for several days and the redness and swelling persisted for about 10 days after the operation and gradually disappeared. A picture taken November 17, 1922 (Fig. II), shows an improvement in the appearance of the nose which was very satisfactory to the patient. The drooping of the tip of the nose noted in both illustrations could not be corrected except by removal of a great deal of the cartilaginous portion of the bridge which very probably would result in collapse of the entire structure.

In Figures III and IV are shown a case of an acquired humped nose as result of a fall in infancy and repeated trauma in boxing. The first illustration shows the hump before operation. On February 2, 1923, an incision was made in the skin of the columella at the tip of the nose, the skin and soft tissues were elevated through this in-

cision upward along the ridge of the nose by means of a Freer's sharp submucous elevator. When the skin and soft tissues had been freely loosened from the underlying bone and cartilage a Ballenger's reverse chisel was introduced into the pocket thus formed and with a downward scraping motion a large portion of the bone and cartilage was removed. The fragments thus loosened were removed and the wound closed with a single suture. A bandage was put on to press rather firmly over the bridge of the nose to prevent the formation of a hematoma. A superficial skin infection appeared the next day over the bridge of the nose, probably from the bandage being too tight. This cleared up in a few days after using hot boric acid solution compresses to the nose. The stitch was removed four days after the operation. The second picture (Fig. IV) was taken on February 20, 1923, 18 days after operation. The skin incision in this case is to be preferred to that used in the first case where the incision was made inside the nose. The skin of the face, nose, and anterior nares may be painted with half-strength tincture of iodine and the operation performed under aseptic conditions, while such manipulation by an intranasal route is fraught with much danger of infection and should not be used. The incision in the columna heals nicely by first intention and leaves no noticeable scar.

In Figure V is shown a depression of a cartilaginous portion of the bridge of the nose following a submucous resection of the nasal septum complicated by a hematoma and abscess formation between the layers of the mucous membrane two months previously. Cartilage was chosen as the material for the transplant to fill the defect. Cartilage is the best material to use in plastic work to fill depressions and to lend support to the overlying skin because it is easily obtainable, is not absorbed even when not in contact with other cartilage or bone, and does not change its shape if the perichondrium is removed. In the case illustrated the depression was so small that a resection of the rib cartilage was not advisable, because it would necessitate a stay in bed of a week. This patient was found to be in Blood Group IV, and all our cases waiting submucous resection were typed until a suitable case was found in the same blood group. The usual submucous resection was done as aseptically as possible on the donor and the cartilage was placed in warm sterile salt solution to await its insertion into the nose of the recipient. After sterilizing the face, nose, and anterior nares with half-strength tincture iodine an incision about 15 millimeters long was made in the columna near the tip of the nose and the skin and soft tissues were elevated over the bridge about half way up. The cartilage was then cut to a shape and size previously determined upon to be sufficient to fill the depression. The cartilage was then inserted into the pocket formed by the elevation of the soft tissues and maneuvered into position,

where it remained in place without the necessity of any sutures. A single horsehair suture closed the skin incision. Healing was by first intension, and there was no local inflammatory reaction following this operation. Figure VI shows the final result and was taken two weeks after the operation.

Patients with lateral deviation of the nose frequently apply for amelioration of the deformity. The writer has handled a number of these cases, one of which is illustrated. Simple fracture of the nose to the convex side is never sufficient in itself to gain a good result without a preliminary submucous resection. The nasal cartilage acts as a spring in these cases and will return the nose to the original position unless a great portion of it is removed. In Figure VII the nose is seen deviated about 1 centimeter out of line to the right side following trauma. This man was previously operated on elsewhere twice for correction of this deformity without improvement. A submucous resection was done February 28, 1923, which resulted in the nose returning about 4 millimeters toward the midline without any other manipulation. A month later the nose was broken under gas anesthesia at the junction of the cartilaginous and bony portions and the nose put in a plaster of Paris cast which overcorrected the deformity. (See fig. VIII.) In Figure IX there is shown the cast removed. The cast was held in place by two bands about the head and was removed daily to allow cleansing. After eight days the cast was removed. The nose finally returned slightly to the right side, but the deviation remaining is very slight.

CLINICAL NOTES.

NOTES ON DAKIN'S SOLUTION.

By J. HOLDEN, Chief Pharmacist, United States Navy.

In the preparation of Dakin's solution by the method outlined in *Practical Bacteriology, Blood Work, Parasitology* (Stitt), sixth edition, a pink color frequently develops in the product after adding the solution containing the sodium carbonate and sodium bicarbonate to the solution of chlorinated lime. The pink color, when present, occurs in varying degrees of intensity, and the intensity of the color slowly increases until the clear solution is siphoned, decanted, or filtered. The absence of a satisfactory explanation of this phenomenon may lead the uninitiated to question the stability and potency of the pink-colored Dakin's solution and the technic of the preparation, and considerable waste of time and material may result in the effort to prepare a solution free from pink color. This pink color apparently does not affect the sodium hypochlorite content of the finished solution, and since the potency of the Dakin's solution is dependent on percentage of sodium hypochlorite present, together with the alkalinity of the solution, it is immaterial whether the pink color is present or not.

Through a recent investigation in the chemical laboratory of the Naval Medical School, it has been determined that the pink color sometimes developed in Dakin's solution is due to the presence of manganese as an impurity in the chlorinated lime.

Chlorinated lime is a commercial product, manufactured by saturating calcium hydroxide (slaked lime) with chlorine gas in leaden chambers. This substance is frequently contaminated with compounds of manganese and iron as natural impurities, and since no effort is made to remove these impurities from the chlorinated product they become factors in the preparation of Dakin's solution.

The U. S. P. does not require chlorinated lime to be free from inorganic impurities; therefore the product has only to meet the pharmacopœial requirement as to chlorine content.

Dakin's solution is prepared as follows:

Solution (A):

Bleaching powder	-----grams	100
Water	-----cubic centimeters	1,000
Shake and mix thoroughly.		

Solution (B) :

Sodium carbonate	grams	45
Sodium bicarbonate	do	48
Water	cubic centimeters	1,000
Dissolve completely.		

Mix A and B and shake vigorously for 5 to 10 minutes or allow to stand in a closed container a few hours. Then filter. This filtrate is the Dakin's solution, which will be neutral to solid phenolphthalein (flash of red with alcohol solution), but will contain about two or three times the amount of NaOCl required. Determine exact per cent of NaOCl and dilute to proper strength.

When Dakin's solution is prepared by the above method the pink color frequently develops after the two solutions are mixed, and this is due to the presence of manganese in the chlorinated lime. The exact form in which the manganese is originally present as an impurity in the chlorinated lime is questionable, but it is a definite fact that in the mixed solution it appears as the bivalent manganate ion (MnO_4). The bivalent manganate ion is only stable in strongly alkaline solutions and is quickly converted to the monovalent manganate ion (MnO_4) or permanganate ion in weakly alkaline, neutral, or acid solutions, particularly so when exposed to the action of CO_2 or the oxygen of the air.

The manganates are green in color, whereas the permanganates are red to purple, and this fact accounts for the slow development of the pink color in Dakin's solution and to the presence of traces of manganese as manganate which is slowly converted to the permanganate form.

It is probable that the manganese is present in the bleaching-powder solution as calcium manganate, and upon mixing the two solutions it is converted into sodium manganate: $\text{CaMnO}_4 + \text{Na}_2\text{CO}_3 = \text{Na}_2\text{MnO}_4 + \text{CaCO}_3$.

The sodium manganate thus formed is slowly changed to sodium permanganate and the pink color is due to the presence of this latter substance.

The pink color can be avoided by filtering the bleaching-powder solution before adding the solution containing the carbonates of sodium, but this has a tendency to reduce the sodium hypochlorite content in the finished solution. Since the presence of the permanganate is believed to be desirable rather than objectionable, this additional step is deemed unnecessary.

The pink color above referred to never occurs in Dakin's solution prepared by saturating a solution of sodium carbonate with chlorine gas.

SURGICAL CASES OF ESPECIAL INTEREST.

By A. H. ROBNETT, Lieutenant Commander, Medical Corps, United States Navy.

CASE 1. J. D., B. M. 1c. Admitted August 1, 1922. Diagnosis, ulcer of skin. Several indolent ulcers noted on left leg, each the size of a half dollar. Laboratory reported *Staphylococcus albus* in smear.

Previous history: Patient had been under treatment for these ulcers on board ship for two months, most of the time at rest in bed, without apparent benefit.

On admission the ulcers were curetted and the edges incised in a radiating manner without success; Wassermann reaction repeatedly negative; August 7, 1922, arsphenamine, 0.6 gm., given intravenously; local and constitutional reaction marked. August 15, 1922, started hypodermic administration of mercury salicytate, gr. 1, twice weekly in buttock; dose kept up for month with no visible improvement. September 21, 1922, scarlet red 5 per cent to ulcers twice weekly. Two additional injections of arsphenamine were given. Biers' hyperemia and X-ray treatments were tried, with no permanent results. Ulcers repeatedly appeared to be healing but quickly broke down again. Operative procedure was then decided upon. November 2, 1922, under general anæsthesia (ether), the ulcers were excised through healthy skin, down to the muscles and a transplant of tissue extending through the skin to the muscles, obtained from the leg, was slid into place and sutured over the site of the old ulcer. In spite of the greatest care, a slight infection took place; under saline and boric acid irrigations, however, all the grafts held and healing by granulation took place. January 11, 1923, cured and ready for duty.

Summary.—(a) Particular attention is drawn to the stubborn resistance of these ulcers to treatment. This man was one of the ship's athletes, a very clean liver, with negative Wassermann reaction, and evidently no specific taint whatsoever. In spite of all medical and minor surgical treatments, Biers' hyperemia, X-ray, and continued rest, no permanent improvement took place, thus necessitating the more radical operation of transplantation of tissue, which resulted in a prompt recovery.

CASE 2. K. G., F. 3c. Admitted February 15, 1922. Diagnosis, influenza (mild attack). Under treatment for 15 days with same diagnosis. Previous to this attack patient had complained of pain in his right abdominal region. Diagnosis then changed to appendicitis, chronic. Was operated upon under ether anæsthesia and a practically normal appendix removed. Carried on the list with this diagnosis for 61 days. Finally, due to the repeated presence of albumin in his urine, which was otherwise normal, diagnosis was again changed to albuminuria, and he was transferred to the

medical service. Continued treatment with diuretics, albumin-free diet, etc., did not improve his albuminuria to any marked extent, and patient, although making an uneventful recovery from the appendix operation, still complained of an indefinite pain in the right side of his abdomen. After several months of treatment with unsatisfactory results, an X-ray picture was taken on August 5, 1922, and revealed a fair-sized triangular-shaped stone in the pelvis of his right kidney. Patient was again transferred from the medical to the surgical service for further treatment. On August 12, 1922, under general anæsthesia (ether) the right kidney was delivered through a postperitoneal route, the pelvis of the ureter opened by a horizontal incision, and a large stone, which was embedded in the calices, removed with considerable difficulty. The wound in the kidney capsule and pelvis of ureter was carefully closed; tubular wick drain was placed against wound in pelvis and brought to the surface; wound in the muscle and skin closed in the usual manner. Patient placed in Fowler's position upon returning to ward from the operating room. The dressings were examined for the next two days, and to our surprise there was no drainage and no odor of urine. On the third day the drain was removed and the wound allowed to heal, which it did promptly. On the fifth day patient was permitted to sit up in a wheel chair, and on the seventh day the stitches were removed. August 25, 1922, wound entirely healed, patient voiding normal amount of urine, which upon examination proved to be albumin-free. September 10, 1922, patient discharged from the sick list.

Summary.—(a) This is the second case the writer has operated on for a kidney stone which had been treated previously for other conditions. This is the third case I have known of which was operated on for chronic appendicitis to find later that there was a stone in the right kidney. With the excellent X-ray equipment of naval hospitals at this time, there is no excuse for overlooking a kidney stone in any case with indefinite abdominal symptoms.

(b) The very prompt healing without drainage in this case is unusual and is hard to explain, unless it might have been due to the formation of a blood clot around the pelvis immediately after operation and the fact that this patient was put on a Gatz bed in the Fowler's position immediately upon his return from the operating room, thus facilitating drainage through the ureter.

CASE 3. A. J., Eng. 1c. Admitted June 1, 1922. Diagnosis undetermined. While working about machinery received a blow in right side of abdomen; complained of pain and tenderness over right epigastric region and there was some distention and rigidity; pulse 110, temperature 100° F. Immediate laparotomy was done; lower right rectus incision. Abdomen found filled with blood which

gushed out when peritoneum was opened. Two lacerations of ileum about 2 feet from cecum were found and repaired and abdomen closed with three tubular cigarette drains; placed in Fowler's position; proctoclysis begun immediately and kept up as long as it was retained; morphine gr. $\frac{1}{4}$, given p. r. n., for pain, June 3, 1922. Much abdominal pain and distention, no gas or feces per rectum, no vomiting, pulse 130, temperature 101° F.; same treatment continued. On June 3, 1922, diagnosis changed to rupture, ileum, traumatic, machine, "H." June 10, 1922, pulse 110, temperature 100° F., gas and feces passing per rectum; a fecal fistula has developed. June 17, 1922, wound entirely healed, feels well, has gained considerable weight.

Summary.—(a) After an extended convalescence patient was returned to duty entirely well, and has continued on duty without complaint for several months.

Case 4. E. H. H., M. M. 1c. Admitted March 28, 1922. Diagnosis, fracture of femur, compound comminuted. Oblique fracture of right femur at junction of middle and lower third; motor-cycle accident. Patient almost exsanguinated when admitted, with end of the femur protruding through the muscles and skin 8 inches above the condyle. X-ray picture also showed a T fracture extending down into the knee joint; put to bed at once and shock combated. March 29, 1922, Hodgen's splint applied with Buck's extension and wounds redressed. Severe infection of wound ensued, and due to his weakened condition from the loss of blood proved very troublesome; temperature rose to 105° F., and there was a free discharge of pus. April 26, 1922, wound healed, extension continued, callus forming, though crepitus still left in leg. May 6, 1922, no further crepitus felt. June 15, 1922, extension continued as false motion present. July 16, 1922, nonunion noted and patient persuaded to permit an open operation. Under general anæsthesia (ether) ends of bone exposed and a piece of muscle was found to be pinched between them. Callus removed from ends of the bone, and a Lane plate screwed into position and a plaster cast applied. Recovery from effects of operation uneventful. September 7, 1922, patient unable to feel any crepitus, so cast was removed and massage begun, knee very stiff. September 14, 1922, encouraged to get around on crutches; patient very enthusiastic and working on his leg almost constantly. November 15, 1922, patient walking on leg and has gradually increased the motion in his knee. March 23, 1923, has improved so much that it is considered only a matter of time until he will be returned to duty well.

Summary.—(a) Combating the infection and healing of the wound took considerable time.

(b) The fractured femur was plated with excellent results. This plate has not been removed and will not be unless it proves trouble-

some. I know of one case in which the plates have remained in place for more than nine years and have given no trouble. The ideal operation would have been bone graft, but not being at that time equipped with the proper instruments this was out of the question.

(c) The helpful assistance of the patient. He daily claims his stiff knee is moving more and more. T fractures into knee joints frequently result in partial ankylosis; however, with perseverance and active and passive movements this may be greatly overcome.

(d) Patient is an excellent motor mechanic and saving him for the Naval Service is considered well worth the time and money it will cost the Government before he returns to duty.

CASE 5. B. F. L., E. M. 3c. Admitted August 6, 1922. Diagnosis, multiple injuries, extreme. Was knocked down and dragged by a passing automobile. Fracture of skull, concussion of the brain, compound comminuted fracture of the lower third of right tibia and fibula, and fracture of metacarpal bone of right hand noted on admission. Patient remained irrational for about six weeks; no signs of compression of the brain; both pupils dilated; spinal puncture negative; 20 mls of spinal fluid withdrawn three times with no appreciable improvement in mental condition. All drugs withdrawn, especially hyoscine and atropine, which it was concluded were at least partly responsible for his mydriasis. Leg put up in box splint, as patient was difficult to control; leg badly infected, but drained freely after removal of fragments of bone. August 30, 1922, under general anaesthesia (ether), right leg was put up in plaster cast, in which windows were cut later. From this time patient showed marked improvement. X ray showed no depression of skull at site of linear fracture of temporal bone located a little above but parallel with the base of the skull. September 5, 1922, under general anaesthesia (ether), complete reduction of fractured leg effected; Lane metal applied to tibia and new cast applied. September 15, 1922, the complete immobilization of the leg has had a marked effect; patient has improved and is rational most of the time. October 18, 1922, opened wound and removed Lane plate; also evacuated about an ounce of thick pus. December 1, 1922, convalescence has continued; is walking around; two small sequestra removed, molds of plate. March 23, 1923, from time to time small accumulations of pus in the vicinity of the fracture have been opened up and drained; X ray shows a large callus, with one small sequestrum posteriorly; wound opened and sequestrum removed. April 10, 1923, cured except for small areas of low-grade infection of cellular tissue and skin, which is yielding to treatment. Patient walks well; has $1\frac{1}{2}$ inches of shortening, but this is hardly noticeable. Mentally and physically, to all appearance, he has entirely recovered.

Summary.—(a) It is interesting to note the long period of mental disturbance following accident (about six weeks), with a marked dilatation of both pupils, pulse and temperature remaining about normal. Spinal fluid normal as to pressure and cell contents.

(b) The ineffectiveness of the Lane plates in this case, due, no doubt, to the lurking infection.

(c) The long-drawn-out convalescence of this infected bone case.

(d) Patient's susceptibility to atropine and hyoscine.

MEDICAL CASES OF ESPECIAL INTEREST.

By J. BUCKLEY, Lieutenant Commander, Medical Corps, United States Navy.

CASE No. 1. D. F. C., F. 2c. Admitted October 26, 1922. Diagnosis, bronchitis, acute. Previous history, negative; temperature on admission, 103° F., pulse 100, respirations 22, white blood count 15,900. Urine positive for albumin, negative for sugar, specific gravity 1022, contained some white and red blood cells and a few casts. This condition continued until November 1, 1922; at this time patient developed drenching sweats and chills, followed by a rise in temperature to 104° F.; pulse varied from 100 to 120. There was a petechial rash on his body, confined mostly to the trunk and abdomen. X ray of chest was negative. Lumbar puncture was performed; fluid clear and cell count not increased. Wassermann reactions of blood and spinal fluid were negative; leucocytosis 15,000. On November 2, 1922, examination revealed soft blowing murmurs over the aortic and mitral areas; blood smears negative. Diagnosis changed to endocarditis, acute. From this time on patient's condition gradually grew worse. He had repeated chills, drenching sweats, and the temperature rose to 104° F., with occasional drops to normal or subnormal. The murmurs increased in intensity. He died suddenly on November 18, 1922. Autopsy revealed an enlarged heart filled with blood; there was some plastic exudate; organized vegetations found on the mitral valve and a large vegetation on the aortic valve. There was an infarct in the right kidney, but no other pathological findings.

CASE No. 2. L. M. H., C. R. M. Admitted July 1, 1922. Diagnosis, poison, arsphenamine, acute. Arsphenamine, gm. 0.6, was given him on board ship June 29, 1922, intravenously, in 10 c. c. of water, without having been neutralized. On admission patient was in an extremely precarious condition; he was markedly cyanosed; pulse 146, respirations 46, temperature 102° F. He was given strychnine sulphate, grs. 1/30, and coffee, 8 oz., by rectum; later he received normal saline, 400 c. c., intravenously; was given sodium bicarbonate by mouth and by proctoclysis and morphine sulphate

when necessary. Patient continued in an extremely critical condition until July 7, 1922. Up to this time his condition closely resembled broncho-pneumonia. Physical examination unsatisfactory; urine positive for albumin and contained many granular casts; complained of intense pain in his abdomen, which gradually diminished. On July 14, 1922, patient was greatly improved; temperature normal, pulse 90, respirations 20, urine clear. Stools and urine were tested for arsenic and none found. X ray showed some mottling of both lungs. Treatment, which had consisted of sodium bicarbonate and purging, was stopped. Patient discharged from hospital August 23, 1922, in good condition and practically well.

Note.—This patient was originally sent to the U. S. S. *Mercy*, with a diagnosis of tuberculosis, chronic pulmonary. There his Wassermann was found to be 4 plus and his lung condition cleaned up under salvarsan. The diagnosis was then changed to syphilis, and he was sent back to his ship.

CASE No. 3. G. W. W., Eng. 2c. Admitted at 11.30 a. m. June 29, 1922. Diagnosis, poison, arsphenamine, acute. At 10 a. m. he had received, on board ship, gm. 0.6 of salvarsan in 10 c. c. of water, without it having been neutralized. Condition on admission good, temperature 98° F., pulse 84, respirations 20. Later he vomited a large amount of bile-stained fluid; external heat was applied; he was given sodium bicarbonate by mouth and rectum and was also given brisk catharsis. Complained of pain in his chest. This condition continued until July 7, 1922, and at no time did he seem to be desperately ill. Physical signs were those of a broncho-pneumonia; his temperature varied from 100° to 102° F.; pulse remained around 100; white blood count was about 9,000; urine at time contained a slight trace of albumin. From this time on patient improved. At one time his pulse dropped to 52; there was no jaundice or bile in his urine; stools were normal. On August 21, 1922, he was granted one month's leave. He left the hospital on October 15, 1922, feeling well; physical examination was then negative, except for a slightly enlarged heart.

CASE No. 4. E. F. E., E. M. 3c. Admitted July 1, 1922. Diagnosis undetermined. He gave the following history: On June 27, 1922, was admitted to the sick list, complaining of pain behind both eyes; had conjunctivitis, increased tension, diminished vision and photophobia; temperature 101° F.; previous history and family history negative. Upon admission to this hospital his temperature was 102° F.; he complained of frontal headache and postorbital pain; physical examination was negative, except for slightly diminished knee jerks. On July 4, 1922, his temperature was 103° F.; white blood count 14,500; he had a suspicious Kernig's sign; there was no stiffness of the neck, no rigidity, no vomiting. On July

6, 1922, Kernig's sign pronounced, and lumbar puncture was performed. Fluid was under slightly increased pressure, was clear and contained no organisms; cell count not increased. Condition remained about the same until July 12, 1922, at which time he developed a lethargy; his temperature was normal in the morning, but rose to 103° F. in the afternoon. On July 31, 1922, his diagnosis was changed to encephalitis, epidemic, lethargic. Diagnosis was based on the following points: Headache, lethargy, negative spinal fluid, and positive Kernig's sign. From this time on patient improved and he was discharged to duty well on October 20, 1922.

CASE No. 5. A. J. S., F. 1c. Admitted November 4, 1922, diagnosis undetermined. He had been sick two days; family history and previous history not obtainable. Temperature was 103° F., pulse 120. Patient was semiconscious and had a mild muttering delirium; there was no rigidity in the neck muscles and he had a slight headache; there was ptosis of both eyes, his eyes were crossed, and there was double vision; spinal puncture revealed a clear fluid under normal pressure; cell count 150 c. c., no organisms found. On November 6, 1922, patient developed twitchings of his hands and legs, and constantly picked at the bed covering; white blood count 15,000. Diagnosis changed to encephalitis, epidemic, lethargic. His condition grew progressively worse and death occurred at 9 p. m. on November 8, 1922; he had two severe convulsions just before he died. Autopsy revealed a swollen and congested brain, the vessels were enlarged and engorged; meninges not affected; there was no other pathological finding.

LIPOMA OF THE ISCHIORECTAL FOSSA.

By L. HUMPHREYS, Lieutenant, Medical Corps, United States Navy.

In Samoa most of the abnormal tissue growths are manifestations of filariasis; the case about to be reported being one of the exceptions to the rule. Lipomas are said to occur wherever there is adipose tissue, and most works on pathology and surgery recount the most commonly occurring lipomas; it may be that in the literature there is a description of a lipoma in the ischiorectal fossa, but I have yet to find it.

The nearest approach to it was contained in an article by Rankin and Scholl¹ entitled "Lipoma of the perineum."

Lipomas are essentially the same the world over, consisting of a fibrous capsule, which sends connective tissue stroma throughout the

¹ "Lipoma of the perineum, report of a case," Fred W. Rankin, M. D., and Albert J. Scholl, M. D., first assistant in surgery and fellow in urology, respectively, Mayo Foundation, Rochester, Minn. Printed in the *Journal of the American Medical Association*, Dec. 9, 1922, p. 1994, vol. 79, No. 24.



Lipoma of ischioanal fossa.



After operation.

mass of fat to divide it into lobes. My case differed in that the masses of adipose tissue also occurred in long strips, flattened like a tape-worm, and when pressure was made in one part of the tumor they would traverse the pedicle and apparently enter the rectum.

A male Samoan, Fanene, age 46, was admitted to the Samoan Hospital with a growth on the right buttock near the corrugator cutis ani. He was in perfect health, with well-developed muscles, and with no history of previous illnesses, except frambesia tropica 20 years before. He stated that the new growth appeared first as a small lump, barely felt until six years ago, when it began to "hang down"; pain was always trivial, there was no discomfort on micturition or defecation, and he thought it was a large yaws granuloma. It is doubtful that the case would ever have come to the hospital for operation, as the symptoms were nil, but he had been reported by one of the native policemen for concealing yaws, as it was the opinion of those of his fellow villagers, to whom he had shown the growth in secrecy, that this disease was responsible for the condition.

After examining the patient I decided the diagnosis could only be made by excluding the following conditions, viz, elephantoid tumor, levator hernia, and supernumerary testicle.

Elephantoid tumor.—There was no evidence of elephantiasis in other parts of the body, no history of elephantoid fever, or any of the other manifestations of filariasis.

Levator hernia.—A review of the literature showed there had been only 13 cases of this condition reported, and all had been in parous females. The location of this tumor was below the subpubic triangle, and there were no classical symptoms of hernia.

Supernumerary testicle.—This was the least likely to occur of any of the conditions, yet in a complete separation of the fibers of the levator ani muscle it might occur. However, there was no pain on palpation, or, when the patient accidentally sat upon the mass, no pulsation in the pedicle, yet when the latter was rolled between the thumb and index finger it felt not unlike the spermatic cord. The skin over the ovoid portion of the tumor was adherent, yet in the pedicle it was loose, like scrotal tissue.

As the growth possessed some of the characteristics of all the conditions mentioned, yet not positive of any, the diagnosis of lipoma was provisionally made.

Operation under chloroform anæsthesia, patient placed in lithotomy position. An incision was made in the long axis of the distal portion; there was slight resistance to the knife until the capsule had been incised. A mass of yellow fat immediately protruded into the wound; this was excised, and an incision made in the long axis of the pedicle; long strips of fat were encountered contained in compartments or channels of connective tissue; these

were freed and the fat excised down to the connection with the buttock.

The mass of skin and subcutaneous tissue formerly covering the pedicle were then excised to the same point, thus leaving an oval denuded area on the buttock corresponding to the insertion of the former pedicle.

Digital exploration at this point revealed an ovoid opening into the ischiorectal fossa (right) about the size of the external abdominal ring, and which admitted only the operator's index finger.

The ischiorectal fossa was explored through this tense fibrous opening; the walls were found otherwise intact, the fossa empty, and the rectal wall smooth. The opening was then obliterated with sutures of chromic catgut and the skin approximated with silk-worm gut.

Patient made an uneventful recovery, was ambulatory in one week, and discharged from the hospital in two weeks.

Conclusions.—Lipoma, pedunculated, acquired, with no calcareous degeneration. It formerly occupied the right ischiorectal fossa, and after its descent through the ovoid opening the latter contracted.

The bulging which resembled a levator hernia was caused by the long strips trying to enter the fossa when pressure was exerted on the distal surface of the tumor.

A METHOD OF BOILING DRINKING WATER FOR USE IN CAMP.

By C. I. Wood, Lieutenant Commander, Medical Corps, United States Navy.

The problem of furnishing a safe drinking water to a complement of over 300 men stationed at the marine barracks rifle range, Santiago, Dominican Republic, presented itself. The source of the water supply is from the Yaque River, which is a stream polluted by the inhabitants of the city of Santiago, many of whom are affected with amebic or bacillary dysentery, typhoid, or paratyphoid infections.

At first, gasoline drums were filled with water, placed over iron bars with a fire underneath, which boiled the water. Later an improvement was devised, which it is the object of this article to describe, as it is original, easily constructed from material already on hand, and it may be of future benefit to some organization situated under similar circumstances.

A battery of four gasoline drums was placed on a support consisting of two steel rails such as are used on railroad tracks. These were built in by the use of bricks and cement and partitioned off, so that each drum has a separate fire box underneath and a separate smokestack made of a section of stovepipe. The gratings for the bottoms of the fire boxes are horizontal $1\frac{1}{2}$ -inch iron pipes, and the

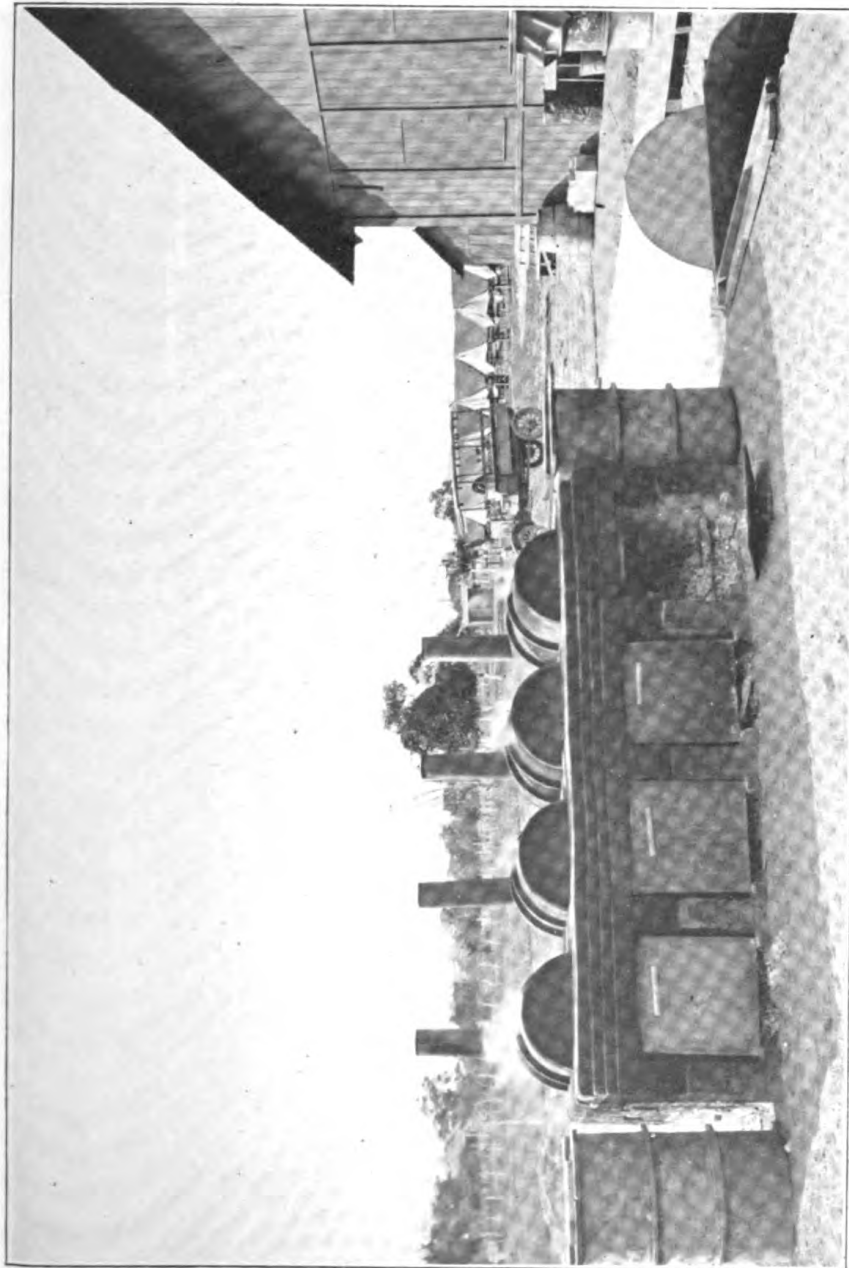


Fig. 1. Front view of furnaces, showing drums in place. The door to the furnace at the right is removed to show the inside of the fire box. The collecting and cooling tank is shown to the right of the furnaces.

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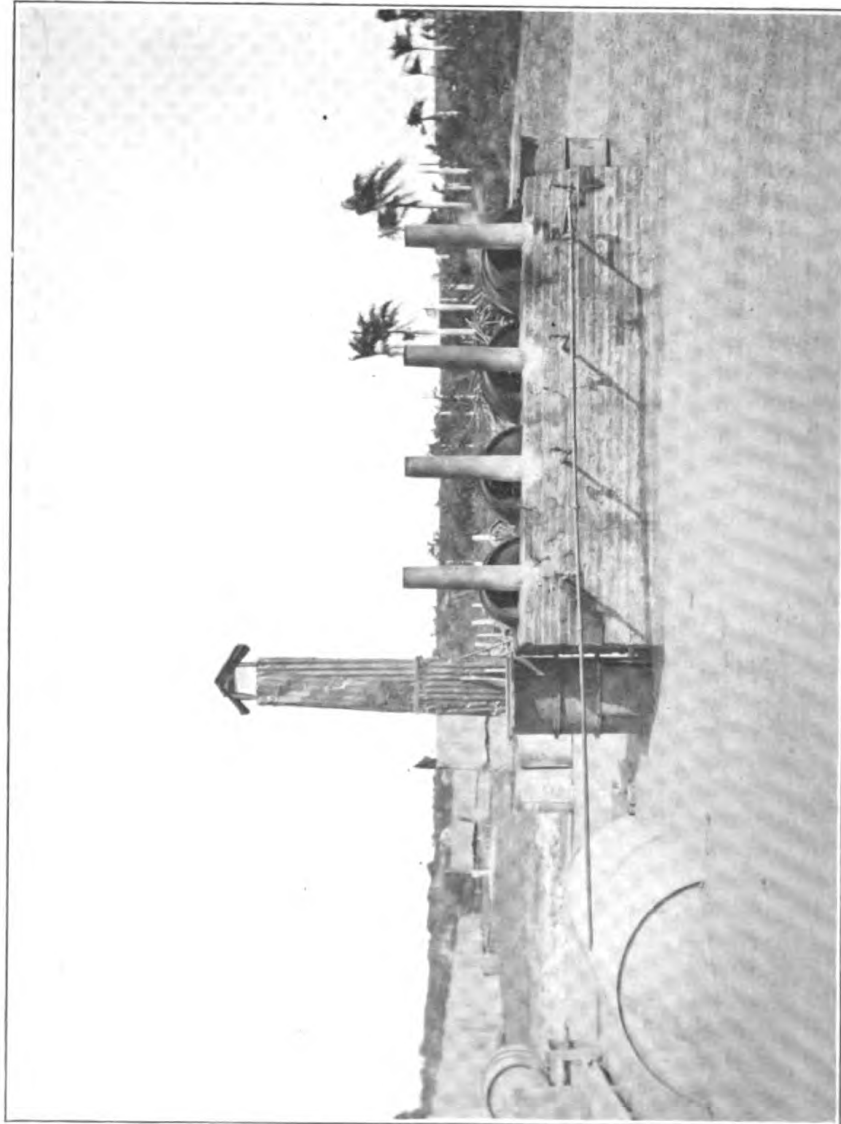


Fig. 2. -Rear view of furnaces, showing smokestacks and pipes for transferring the boiler water from the drums to the tank.

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doors are square pieces of sheet iron provided with a handle. The doors are not hinged and are merely set in place, slightly tilted, resting on brick shoulders a short distance above the ground.

At the rear of the furnace, outlet pipes are used to remove the water after boiling by turning a valve provided for each drum. The water from each drum then flows to a large collecting and cooling tank which is partially submerged in the ground. An excavation at the end of the tank lined with bricks allows the water to be drawn off for use by means of a faucet at the dependent portion of the tank.

By this system 500 gallons of water are boiled and cooled daily with only one handling.

A further improvement is being added by connecting a Darnall filter with the conduit leading from the drums to the collecting tank for filtering out any sediment that may be present in the water after boiling, thereby avoiding the formation of sediment in the tank.

The above materials should all be easily available in a marine expeditionary force. Gasoline drums are available. If the large collecting tank is not available or can not be made from material on hand, a series of barrels or gasoline drums could be connected by piping and used for this purpose. If cement is not available, clay could be used to fill in the interstices of the furnace satisfactorily. The pipes and fittings are usually on hand, but if not they are procurable from the war vessel that transports the force to the point of debarkation.

A FATAL CASE OF CAISSON DISEASE.

By C. P. ARCHAMBEAULT, Lieutenant, Medical Corps, United States Navy.

The patient, after diving to a depth of 120 feet on the morning of January 11, 1923, removed his helmet when he had slowly ascended to a depth of 60 feet and immediately came to the surface. Shortly after noon he developed symptoms of caisson disease, and having become unconscious at 2 p. m., he was placed in a diving suit and lowered gradually to a depth of 60 feet. When the writer arrived on the scene the patient was at a depth of 20 feet, from which he was gradually brought to the surface. He was still unconscious and was quite cyanotic. Pulse was over 150 and respirations were rapid. As the patient had not improved at a depth of 20 feet, which represents about 10 pounds of atmospheric pressure, he was placed in the torpedo room of a submarine, at a pressure of 16 pounds, at which pressure he remained from 6.10 p. m. to 6.45 p. m. During this time he had violent convulsions but gradually improved. Regaining consciousness he complained of general bodily pain. From 6.45 to 7.15 p. m. the pressure was slowly reduced to 10 pounds, at 7.30 p. m. to 8 pounds, and at 7.45 p. m. to 6 pounds. At this time his pulse was

140 and respirations were 30. Pressure was reduced to 4 pounds at 8.10 p. m., and at 8.20 p. m. to 2 pounds. He complained of diminished vision. By 8.45 p. m. all excess pressure had been removed. The patient apparently was in fair condition, but at 9.15 p. m. he had a severe convulsion and became unconscious and cyanotic. He was placed once more in the pressure chamber and the pressure gradually increased to 16 pounds, all the pressure available. At 10.15 p. m. he had a second convulsion, pulse became too rapid to count, respiration was over 50, but the cyanosis had disappeared. At midnight the patient was still unconscious, respiration 56, again cyanotic, and pulse too fast to count. At 1 a. m. Cheyne-Stokes breathing occurred; shortly after this the patient died.

FOREIGN BODY IN THE NARES.

By C. B. CAMERER, Lieutenant Commander, Medical Corps, United States Navy.

During the routine physical examination of a seaman, age 22, who had been admitted to the medical service of the hospital ship *Mercy*, it was noted that he had difficulty in breathing through the right nostril. When he was referred to the nose and throat service for examination, what appeared to be a thick mass of mucus was observed well back on the floor of the right nostril and apparently adherent to the right septal wall. However, following routine cleansing procedures, the mass was still present, and upon further examination was found to be hard, rough, and firmly attached, which fact led to the supposition that it might be an aberrant tooth or possibly a neoplasm or foreign body, and an X-ray examination was ordered.

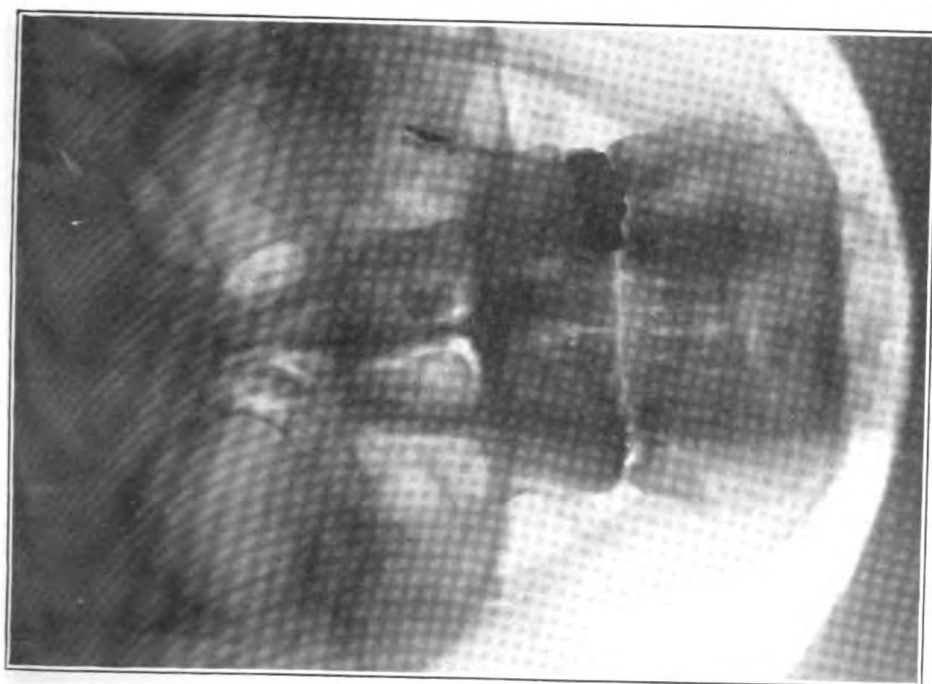
A foreign body of some sort, circular in outline, about 12 millimeters in diameter when viewed laterally, and uniformly of about 6 millimeters in thickness when viewed antero-posteriorly could be plainly discerned in the X-ray plates.

Under local anesthesia removal was accomplished with considerable difficulty, the mass being firmly attached to the base of the septal wall. It was found to be a piece of cork, thickly calcified, which had eroded through the nasal mucosa and became firmly adherent to the deeper structures.

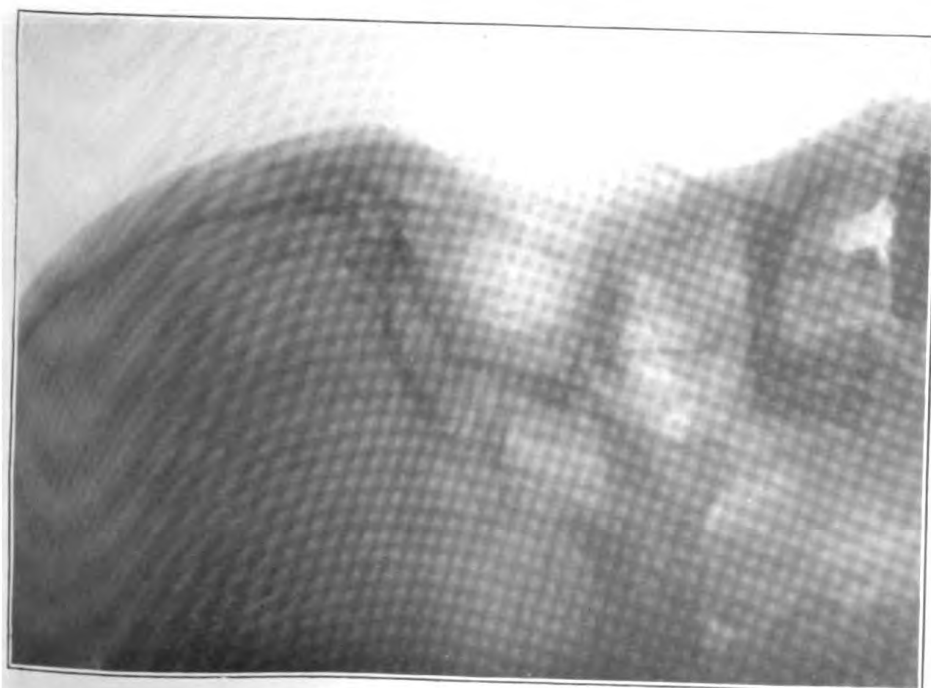
Following removal and routine local treatment at site of attachment, recovery was uneventful.

Several days subsequent to the removal of the foreign body the patient stated to the writer that he recalled very dimly having been attended by a physician at the age of 5 years for some kind of nasal trouble, and as he recollected, there was some question of a foreign body having been introduced either by a playmate or himself.

This case is considered to be of interest in view of the long period of time this foreign body had been in the nostril (about 17 years)

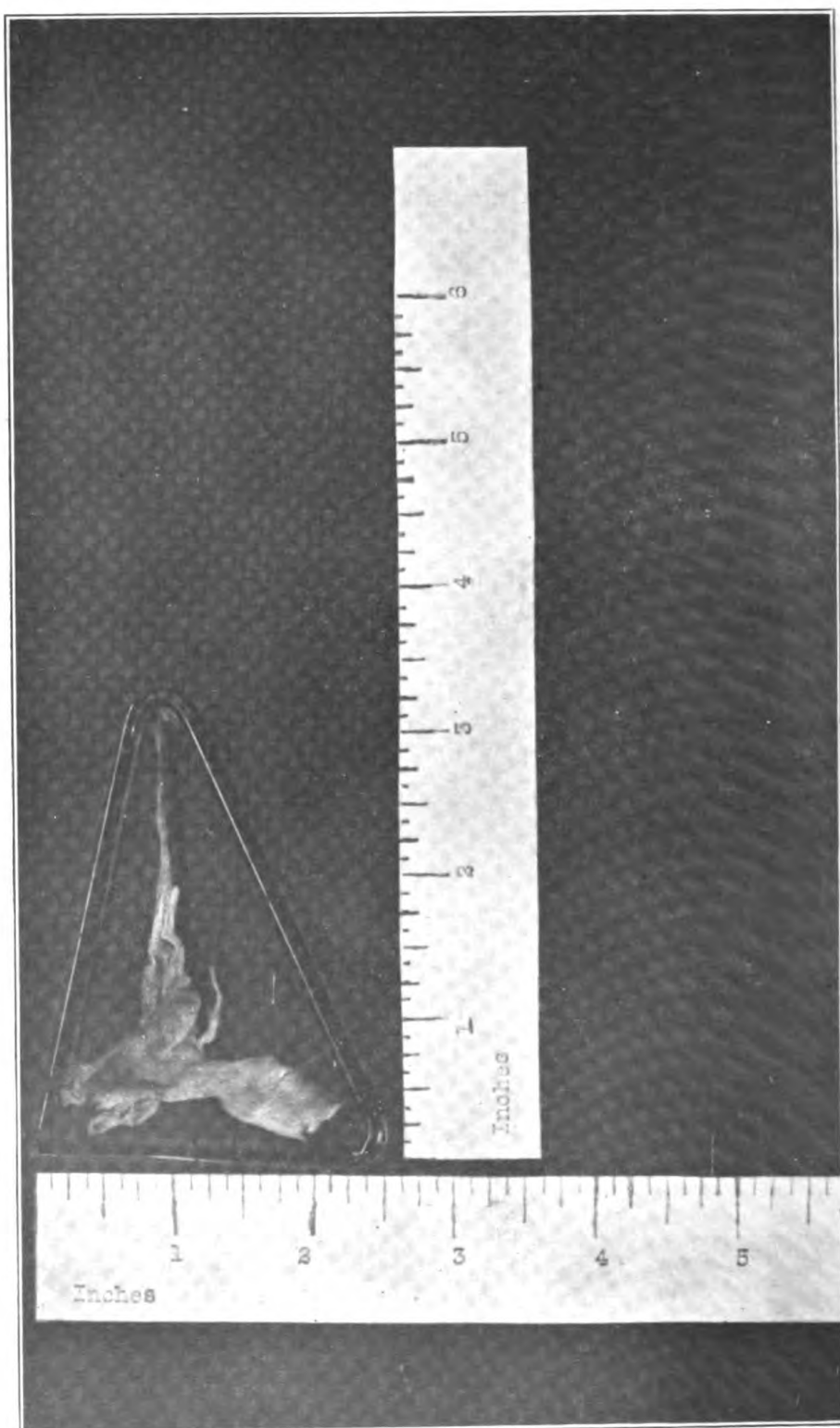


Foreign body in nose.



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Large nasal polyp.

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and the lack of symptoms (or their disregard) by the patient prior to admission, also for the dense calcareous deposits which had thoroughly permeated the cork, and further, for the attachment to the deeper structures, requiring the employment of considerable force to facilitate removal.

AN UNUSUAL NASAL POLYP.

By P. M. ALBRIGHT, Lieutenant, Medical Corps, United States Navy.

W. J. D., Veterans' Bureau case, age 32, white, was admitted to United States naval hospital, League Island, Philadelphia, Pa., on January 2, 1923, with the diagnosis of "large nasal polyp."

The patient gave the following history: For the past four years has had headaches (frontal), which were worse in the morning upon arising and gradually cleared during the day. States that he has had discharge from both nostrils and has had difficulty in breathing through left nostril. At times he could feel an obstruction in his left nares which he would attempt to pull from nose and which family physician also attempted to remove but unsuccessfully. Says that obstruction was relieved at times by posture, and that he always had a foul odor to his breath and a foul taste in his mouth.

Examination showed a large nasal polyp, which filled the entire left anterior meatus and which upon postnasal examination was found to hang into the epipharynx. Upon shrinking it was found that the polyp was suspended by a long pedicle which had its origin in the left antrum; the pedicle coming from the sinus, passing under the left middle turbinate and extending over the inferior turbinate. Examination of the nasal accessory sinuses was clinically negative. Transillumination showed a clouding of the left antrum, which was confirmed by X ray. Needle puncture of left antrum and irrigation with normal saline showed washings clear.

As the sinus was clinically negative and there was no evidence of pus in the washings nor evidence of an otitis by X ray, it was thought that the clouding was most likely due to the thickened membrane of an old chronic maxillary sinusitis from which the polyp had its origin.

The polyp, with pedicle, was removed under local anaesthesia. The posterior portion of the polyp which hung into the pharynx showed degeneration and had a very foul odor.

The accompanying illustration shows the size of the polyp and pedicle, which has shrunk considerably due to the action of the cocaine before removal and action of the preserving fluid.

This case has the following points of interest: Long duration, size of polyp, its origin, and length of pedicle.

REPORTS.

A REPORT ON THE SANITARY CONDITIONS OF THE SECOND BRIGADE, UNITED STATES MARINES, SANTO DOMINGO, FOR THE YEAR OF 1922.

By J. J. SNYDER, Commander, Medical Corps, United States Navy.

History and description.—I am prefacing my annual report with a description of the country occupied by the Second Marine Brigade so as to make it clearer and to show the kind of duty the troops were called upon to perform. The island of Haiti or Santo Domingo lies between $68^{\circ} 20'$ and $74^{\circ} 30'$ west longitude, and $17^{\circ} 36' 40''$ and $19^{\circ} 58' 20''$ north latitude and contains 28,987 square miles. It is divided into the two countries of Haiti and the Dominican Republic, and it is only with the latter that we have to deal. The Dominican Republic, or Santo Domingo as it is usually called, occupies the eastern two-thirds of the island, and contains 19,325 square miles. The entire island is mountainous, the ranges having an easterly and westerly trend, with fertile valleys in between. When a British King asked an admiral fresh from the Spanish possessions to describe this island, he took a sheet of paper in his hand, crumpled it, then threw it on the table, exclaiming: "There it is, Your Majesty!" The description still holds. With a mountain peak towering to a height of over 12,000 feet, and many others of lesser height, and caressed by the unceasing trade, many varieties of climate may be found, and most of them salubrious and inviting. The character of soil and the vegetation vary between the wonderful Vega Real of the north and the desert regions around Lake Enriquillo in the southwest. The rainy season is expressed by the character of its flora, so we have forests and jungle or cactus. Irrigate the desert, as at Barahona, and it responds abundantly. The native fauna are negligible. A ratlike animal and birds of the same varieties as are in the United States are found. There are a few snakes, and alligators are found in Lake Enriquillo.

Population.—This is of mixed races. The Spanish, French, Negro, and Indian races predominate, while there is a sprinkling of other races. As the first-settled country of the New World, it attracted the hardy conquistadores of Spain who quickly overran it and convinced its original Indian proprietors by means of the sword

that they were here to stay and be the masters. While the Spaniards were engaged in this congenial occupation the Indian race succumbed so rapidly that from an estimated population of 2,000,000 at the time of discovery, by 1533 only 4,000 survived. As mention of the Indians in official documents ceased about this time, the race must have become negligible. The great, tender-hearted Bishop Las Cases, shocked by this treatment of the Indians and their rapid diminution in numbers, recommended the employment of negro slaves in their stead, and this was the introduction of the negro, and slavery to the New World. This curse of slavery endured until about 1825, when it was abolished, but meanwhile a large negro population developed and the revolt of the slaves in Haiti resulted in the establishment of the Haitien or Black Republic.

The relations between Haiti and Santo Domingo have not been cordial at all times, and in fact Santo Domingo was under the rule of Haiti from 1822 to 1844, when a successful revolt terminated it. Under the Haitien régime, the white residents emigrated in large numbers, and, as they represented to a great extent the wealth and culture of the country, it suffered accordingly.

The island was discovered by Columbus and the first permanent settlements in the New World were made within its confines. When the *Santa Maria* was wrecked near Cape Haitien, Haiti, and only the *Pinta* and *Nina* were left to continue the voyage, it became necessary to leave 39 men behind to await a second expedition. Their fate is still a mystery and they founded no permanent settlement to welcome other voyagers.

Isabela, Santiago de los Caballeros, Seibo, Santo Domingo, and other cities were founded, and exploratory expeditions were sent out. Ojeda brought in a rebellious cacique by a ruse. The early discovery of gold resulted in the ruthless exploitation of the natives.

Plantations were laid out and the country developed rapidly. Santo Domingo City became the capital of the New World, and remained as such until displaced by the greater wealth and importance of the City of Mexico. The island and its cities have been fair prey for pirate, buccaneer, and military commander. Its cities have been sacked or held for ransom, and it was a pawn in the hands of statesmen and politicians for 200 years.

Such is the country with its romance and pathos in which our men are serving. A land of manana and charm where the dreamer can imagine as he threads the lonely trails over rugged mountains or through jungles of the valleys that he is following in the footsteps of Columbus, or some conquistador bent on finding El Dorado, or else some humble priest carrying a message of peace and good will so greatly at variance with the practices of his countrymen.

So you can imagine how the duty appeals to some, who, from these and other motives, extend their tour of tropical service, and how distasteful it can be to others who crave the excitement of the great world and its achievements. There are points of historical interest for the student and shrines for the devout. Legend and romance have their homes here, while history has been made on these shores.

The house of Diego Columbus still stands a ruin in Santo Domingo City, with the stump of the giant ceiba tree on the river's bank below, to which tradition says his father secured his ship. The chapel of the cathedral Drake occupied as quarters while he held the city, now reechoes to the sounds of religious service, while a mute reminder of his visit is a cannon ball embedded in the roof of the same building.

The Santo Cerro, near La Vega, was the scene of a battle between the Indian and Spaniards, in which Columbus participated, and which is now surmounted by a church which attracts throngs of the devout natives.

The past year has seen many changes in Santo Domingo, including the formation of a provisional government and the preparations for the establishment of a permanent government.

This resulted in the abolition of the military government and the consolidation of the brigade, first into two regiments, the First and Fourth, and later these two regiments were concentrated in the garrisons of Santo Domingo City, San Pedro de Macoris, Santiago, and Puerto Plata.

A mounted company was left at Chicharrones, near San Pedro de Macoris.

Probably for the first time in the history of Santo Domingo banditry was exterminated. This was accomplished by a well-thought-out plan of campaign and the rigorous execution of it after its inception.

The urban population can now live in peace, and the good effect of this great accomplishment will soon be apparent. Its execution was not always accompanied by bloodshed, as might have been expected, judging from the character of the persons sought, but the thoroughness of the plan showed the leaders the hopelessness of their remaining in outlawry and their surrender followed.

This one accomplishment alone shows that a military occupation may be an instrument of great good to a bandit-infested country. The bringing of law into a region where previously lawlessness rules will make an impress for good even after the means of its coming has been withdrawn.

"Due process of law" does not necessarily mean that the person must be brought to the law, but may mean the bringing of the law

to the community or person, and this is what was accomplished. The bandit chief is no longer a bigger man than the governor of a province or alcalde of a commune. I have dilated on this because I regard it as one of the major accomplishments of the occupation.

The security and protection of human life are of so much greater importance than the protection of wealth that the latter sinks into obscurity.

It has always been popular to dilate on the evil doings of a ruthless soldiery in a foreign land, but there is another side to the shield.

A foreign soldiery is not always ruthless or licentious; it may have a vision, or a dream to help people needing help; it may feel that it is its duty to show them easier modes of life, and modern ideas of sanitation so as to reduce their death rate, and hospitalize their sick and helpless.

After the extermination of banditry the brigade settled down to garrison life in the various posts.

Mapping details were sent out and the data for a modern map of Santo Domingo gathered. Mountains were scaled, forests traversed, and desert wastes crossed. This was popular duty; it had novelty and a spice of danger which always appeal.

No one knew what was on the other side of the mountain range or where the next water might be found. It was hard duty, but it had its compensation.

During the year the Fourth Regiment mapped 9,000 square miles of territory, covering a period of five months. During this time not a man was lost, and the only case of illness or accident was when a horse fell and his rider was bruised. This is a remarkable record.

This detail was given a course of field sanitation previous to going into the field.

The concentration of the brigade allowed long-cherished plans of the brigade commander to forge it into a well-drilled military machine to be carried into effect.

The old days of an hour's drill on a parade ground, then guard duty or police detail for those whose turn it was to police the post, and monotony for the remainder have passed from the modern soldier's life. Now it is like a modern school system, progressing through the various grades until graduation day arrives, which in this case means fit to face a modern highly civilized enemy. As this method of training is progressive it lacks the deadly monotony of the maneuvers of a parade ground and the interest of the soldier is held. Supplementing this, but of minor importance, are the various forms of amusement—movies, baseball, etc.—to keep him contented.

Of what interest is all this in a brigade surgeon's report, may be asked. The methods of securing contentment of a command are

always of interest to its medical officers, for a contented command is a healthy command.

In a country where liquor of the cheap and nasty variety can always be procured by the man bent on finding it, and where enterprising females similar to the liquor are waiting for him, it is of vital interest to the brigade surgeon and every other medical officer that means are taken to keep him contented and away from the two main dangers to the soldier in garrison.

The concentration of the brigade into the posts of Santo Domingo City, Santiago, San Pedro de Macoris, and Puerto Plata resulted in the abandonment of many small outposts. This gave larger garrisons at the posts mentioned, but with the paradox of requiring fewer medical officers and hospital corpsmen.

No work of the doctor was slighted; in fact, the three hospitals of the brigade—the base hospital at Santo Domingo City and the field hospitals at Santiago and San Pedro de Macoris—give opportunities for careful study that isolated duty in a small community denied them.

Standard treatment of malaria occurring in brigade.—To keep down the incidence of malaria the brigade surgeon sent the following letter¹ to the regimental surgeons:

“A standard treatment for malaria was adopted by the national malaria committee at a conference on the treatment of this disease. The treatment proposed is as follows:

“For the acute attack, 10 grains quinine sulphate by mouth three times a day for a period of at least three or four days, followed by 10 grains every night before retiring for a period of eight weeks. For infected persons not having acute symptoms at the time, only the eight weeks' treatment is required.

“The proportionate dosage for children are: Under 1 year, one-half grain; 1 year, 1 grain; 2 years, 2 grains; 3 years, 3 grains, and 4 years, 3 grains; 6 and 7 years, 4 grains; 8, 9, and 10 years, 6 grains; 11, 12, 13, and 14 years, 8 grains; 15 years or older, 10 grains.

“The object of the treatment is not only to relieve clinical symptoms, but to disinfect the patient in order to prevent relapse and transmission to others. Too little attention has been given in the past to this. The proportion of cases of malaria treated by physicians that are actually cured of the infection is ridiculously small.

“This is due largely to the insufficient method of treatment employed. A standard method of treatment, if efficient, would tend at least to change this condition and considerably reduce the number of malaria carriers, potential sources of infection.”

¹ Bass, C. C. The standard treatment for malaria, *Southern Medical Journal*, April, 1921 (p. 529, U. S. Naval Medical Bulletin, March, 1921.)

That it had that effect may be seen from the low incidence of the disease during the year.

Venereal diseases.—The venereal problem was also with us and was one of magnitude. With a limited strength of command, it was necessary, so far as it could be accomplished, to keep the noneffective rate as low as possible, and one of the most disabling conditions to a command is a high venereal rate. To prevent this the arrest, segregation, and treatment of prostitutes was rigorously enforced. Not only was the female offender placed in arrest but, whenever possible, her male exploiter also. This was a most unpopular procedure with this type of human putrescence, but it served in making them far less open in plying their noisome occupation. The "fear of God" was also put in the "cocheros," and few had the temerity to take marines or sailors into the "out of bounds" district. The end result was that the disease rate from venereal disease in the brigade fell off appreciably during the latter half of the year.

The rate for venereal disease remained low for about one month after the provisional government was installed and then rose abruptly. It was found that that sinister curse of good government, graft, came in with the new administration and that the officials who took over the care of the incarcerated women released them upon the payment of money, irrespective of whether they were free from disease or not.

As could be expected, this soon had its effect on the venereal rate of the garrisons of Santo Domingo City and its environs and resulted in the military governor requesting that the care and treatment of these unfortunates be returned to the brigade medical officers. This was acceded to, and their care was resumed at the end of the year.

Inspections.—Inspections of the principal posts were made during the year and the conditions of the command ascertained.

As the various outposts were withdrawn the medical officers and hospital corpsmen were assigned to new stations, and they turned in the property in their charge to the regimental surgeon of the regiment to which they were attached.

After the outposts were withdrawn mapping details continued in the field. Hospital corpsmen were detailed to accompany them and did excellent work. Usually the hospital corpsman with an isolated detail was held in esteem by the native population and was of assistance to the sick of the district.

Mosquitoes.—An entomological survey of the island shows the presence of the following common varieties of mosquito: *Anopheles*, *Stegomyia*, and *Culex*.

Barring yellow fever, most of the other mosquito-borne diseases are present. Filariasis and yaws have been seen among the natives.

Malaria and dengue were present among the troops. Malaria was usually of the benign type, although the pernicious form was present and fatalities resulted. When the past records of troops on this island are considered we can be thankful for a year singularly free from a severe visitation of this source.

Malaria.—Contrast the following extract from Munson (Munson, Theory and Practice of Military Hygiene, pp. 698–699) :

“Malaria has ravaged armies in every age and climate and has frequently modified military operations or brought about their failure. Rome was saved from capture by malarial fevers, which so scourged the besieging Gauls under Brennus as to cause their retreat. In the year 208 the Roman Army in Scotland lost 50,000 men out of a total of 80,000 from this cause. No military disaster caused by malarial infection was more complete, however, than that of the British expedition to the island of Walcheren in 1809. On this occasion it had been said that the British were conquered before the battle. Out of the effective force of 39,219, there succumbed to the fever between August 28 and December 1 no less than 23,175 men, while after the return to England there were 11,503 additional cases. But 217 men during this disastrous expedition were killed by the enemy. In the Seminole War, in Florida, our troops suffered severely from malarial infections. In the French Army before Sebastopol there were 20,623 cases with 2,179 deaths. In the Union forces during the Civil War there were 1,314,744 cases of malaria, with 10,062 deaths, giving a mortality of 3.92 per thousand strength. But though the mortality from these fevers was comparatively light, their influence in detracting from the efficiency of the Army was very great—as well as largely influencing the rates of discharge for disability on account of resulting anæmia and chronic malarial poisoning. The so-called ‘Chickahominy fever’ was particularly severe in its effects. Malarial fevers prevailed in the French Army during the Italian War and the occupation of the Papal States. Ashmead states that 5,995 Japanese soldiers sent to Formosa in 1873 furnished 6,105 admissions to hospitals, for continued malarial fevers, in a single year. In the French expedition in Madagascar in 1895, out of a force of 22,850 men—combatants and carriers—there were 7,498 deaths from disease, a mortality of about 33 per cent. Nearly all the deaths were from malarial fevers. During this expedition only 7 men were killed by the enemy and but 94 wounded. In the same year a Spanish expedition in the Philippine Islands was scourged by malarial fever. During the last insurrection in Cuba the Spanish forces were largely depleted by malarial infections of a severe type; the admissions to hospitals for this cause during the year 1897, after the capture of Santiago, one-half of our forces in Cuba were incapacitated for duty at the same time by reason of malarial fevers.

This grave condition of affairs evoked an appeal to the War Department, signed by all the officers of high rank, for an immediate removal of these troops to a more healthy locality, using the sentence: 'This Army must be moved or perish.' (Theodore Roosevelt was one of the signers of this famous round robin.)"

Yellow Fever.—While yellow fever has disappeared from Santo Domingo, the following shows the ravages of this disease in former military operations (Munson, *ibid.*, p. 744):

"Yellow fever is essentially a disease of tropical and subtropical countries, and within these it is ordinarily restricted to well-defined geographical limits and, to a considerable extent, to the summer or rainy season. Bodies of troops serving within these limits of infection for any length of time, during the yellow-fever season, have uniformly been more or less affected by it. In 1648 'there occurred in Habana, and in the fleet of Juan Pujados, a great pest of putrid fevers. A third part of the garrison and a larger part of the crews and passengers in the vessels died.' The disease was extremely fatal among the British troops which captured Habana about three centuries ago, and it is interesting to note that the regiment of loyal Americans recruited largely from the southern part of the country was least affected.

"In 1740 in the expedition against Carthagena its effects were most disastrous. In 1780 a force of 8,000 Spanish soldiers was landed at Habana and within two months had lost 2,000 men from the disease. In 1794 'the vomito appeared so severely that solely of the garrison [of Habana] and of the squadron more than 1,600 victims were taken. It was indispensable to resort to a general levy to replace the losses on the vessels.'

"In Haiti, during the rebellion of the blacks, the French Army of veteran soldiers was practically annihilated by yellow fever. Of this epidemic Lemure wrote: 'In 1802 an army under the orders of General LeClerc embarked for Santo Domingo. The effective strength on leaving Brest was 58,545 men. In four months 50,270 men were dead, chiefly of yellow fever, which gave 82.5 per cent of the total mortality. Of the 8,275 men remaining, 3,000 were sick or wounded. In 1809, seven years later, this army was reduced to 300 men, who returned to France.' The French also suffered from yellow fever during their occupation of Mexico. According to Coustan, there were 1,705 cases, the fever breaking out six days after the landing at Vera Cruz. During the Civil War there were in the Union forces 1,371 cases and 436 deaths, and in 1867 the disease attacked a number of southern posts and caused 1,520 cases with 453 deaths. The Spanish Army in Cuba has always suffered severely from this disease, especially during the epidemics of 1876-77 and 1896. The

British and French troops which have been stationed in the West Indies have also been repeatedly attacked."

Smallpox.—An epidemic of smallpox was prevailing when the year was ushered in, but vaccination, as always when carefully performed, was the sheet anchor of protection, and only nine cases occurred in the brigade during the year. All persons requiring it were vaccinated during the year.

Eleven hundred and ninety-nine deaths among the native population were reported to the sanitary authorities during the period of the epidemic embraced between the week ending November 5, 1921, and that ending April 5, 1922.

The protection afforded the brigade was the more remarkable in that the vast majority of the native population are innocent of any knowledge of quarantine, and made no attempt to limit the disease unless the matter was enforced by the marines.

Water.—Two things seem anomalous here. First, that in a country situated in the Tropics and with an abundant rainfall over much of its area, there should be a scarcity of water in its principal cities; and, second, that in the oldest city in the New World there should be no municipal water supply of either public or private ownership.

Cisterns to catch and retain the rainfall are the main source of supply, supplemented by brackish wells. In Santo Domingo City the water has a hardness of 333 parts per million or, according to Clark's scale, of 23.2°—not the most satisfactory water either for bathing or household purposes.

The water situation of the brigade was well described by my predecessor in his yearly sanitary report for 1921.

At Santiago a pump to supply the garrison in Fort San Luis from the Yuna River was installed during the year.

Housing and sanitation of the brigade.—The concentration of the brigade has put all but the men on the training centers under roof. Men undergoing training are under canvas, but in well-policed and hygienically conducted camps, and their health is very good.

The men quartered in Fort Ozama at Santo Domingo and Fort San Luis in Santiago live largely in portable buildings erected within the forts. The casemates of Fort San Luis are large, airy, and quite comfortable. The use of mosquito nets is obligatory. The permanent camp or barracks allows of the installation of an electric lighting system and a water supply, both of which add to the health and happiness of a command.

The brigade surgeon notes with pleasure the care exercised by the medical officers in looking after the sanitary details of their posts. Latrines were well policed; garbage was disposed of; water was boiled; sleeping under mosquito nets enforced; antityphoid and cowpox vaccination carried out; sanitation of the camps and environs

supervised where practicable and where conflict with the local sanitary authorities did not result. All the matters enumerated soon became matters of routine for the post medical officers, and the hospital corpsmen on duty with small outlying detachments had been so well indoctrinated with the practices of the larger posts that they also carried them into effect.

Hospitals for the brigade.—There are three hospitals for the treatment of the sick of the brigade, located as follows: Base hospital, Santo Domingo City; field hospital, First Regiment of Marines, San Pedro de Macoris; field hospital, Fourth Regiment of Marines, Santiago.

These hospitals have been fully described in previous reports, so no further description is necessary.

I have only to add that, in my opinion, no native building, as at San Pedro de Macoris, should be taken for hospital purposes so long as temporary buildings, more sanitary and suitable, can be erected within a reasonable time.

The rental and the sum necessary to convert such a building to hospital purposes are too great for the service rendered. The Aladdin type of building is much more satisfactory in the Tropics.

The concentration of the brigade into the garrisons at Santo Domingo City (served by the base hospital), San Pedro de Macoris (field hospital), and that at Santiago (field hospital) was the necessity for three widely separated institutions.

All three are well equipped as to stores and personnel.

The bed capacity is as follows: Base hospital: Officers, 4; enlisted, 33. San Pedro de Macoris: Officers, 0; enlisted, 17. Santiago: Officers, 4; enlisted, 30, plus 6 beds in 3 hospital tents for communicable diseases.

Medical supplies.—These have been ample and always of excellent quality. To prevent any great accumulation of surplus supplies, all requisitions, so far as possible, are filled in the island, and requisitions on the Medical Supply Depot only made for those not available locally.

This has resulted in reducing the surplus supplies on hand and also the expense of shipment from the United States of stores available here. In doing this the surplus of one post was called in in the hope it could be used to supply the needs of another.

As the definite policy of the United States is to withdraw the marines as soon as a regular government is installed, requisitions on the Naval Medical Supply Depot are held to a minimum so as to have as few stores as possible on hand when the troops embark.

Food of the brigade.—The markets supply the following tropical fruits in season, which are appetizing to the man accustomed to the luscious fruits of the temperate zones: Oranges, grapefruit, pineapples, mangoes, bananas, avocados, limes, and coconuts.

In the large cities the prices of all these are very high, while the prices of the fruits from the Temperate Zones, such as apples, pears, peaches, and grapes, which are exposed in the markets, are prohibitive to a garrison mess except on holidays or special occasions. Under these circumstances rather a monotonous menu must be served.

Very good fresh beef is obtainable in the local markets. The post bakeries supply excellent bread. The training of cooks for the Marine Corps would result in better-prepared food and most likely in a more economical administration of the ration.

Incidence of disease.—The attached table shows the admissions to the sick list of the brigade. The strength of the brigade, by months, was as follows:

January.....	2, 471	September.....	2, 242
February.....	2, 413	October.....	2, 251
March.....	2, 273	November.....	2, 053
April.....	2, 288	December.....	2, 049
May.....	2, 239		
June.....	2, 144	Average strength for the	
July.....	2, 165	year.....	2, 228
August.....	2, 155		

The rainfall for the first nine months of the year was low and there were no long periods of wet weather. Malaria showed a rather persistent incidence throughout the year, while dengue showed a considerable increase in August, September, and October.

Dysentery was also present and was the cause of two deaths.

The principal causes of admissions were as follows: Gonococcus infection of urethra, dengue, malaria, chancroid, syphilis, dysentery, and smallpox.

	Original admissions.	Annual rate per 1,000.	Sick days.
All causes (diseases and injuries).....	2, 535	1, 137.79	15, 898
Diseases only.....	2, 346	1, 052.51	14, 067
Accidents and injuries other than drownings.....	187	879	1, 771
Communicable diseases:			
Gonococcus infection of urethra.....	264	118	582
Dengue.....	262	116	1, 010
Malaria.....	221	99	454
Chancroid infection.....	216	96.9	413
Syphilis.....	137	61.04	893
Dysentery, all forms.....	134	60.14	794
Smallpox.....	8	3.59	252

When you compare these figures with those given by Munson in his *Military Hygiene* for the French troops in Haiti under LeClare in 1803, the difference is tremendous. His losses were appalling, and caused Napoleon's plan for an empire in the New World to be abandoned. Now, thanks to our knowledge to the causes and carriers of most tropical diseases, preventive measures can be instituted and a military force can occupy a tropical country without the terrible death rates of previous expeditions prior to these discoveries.

SUMMARY.

What measures should be instituted to keep an expeditionary force fit for service in the Tropics?

1. Moderation in all things when possible—drills, athletics, marches, etc.

2. Avoiding exposure combined with exertion during the heat of the day, unless unavoidable. The natives have shown that the siesta is of value.

3. The food should be nutritious and well cooked, with an abundance of fruit.

4. A water-boiling detail should be routine in camp or field.

5. The insistence on the use of mosquito nets and careful nightly inspections by the sentries will show results in a low malarial incidence.

6. Insistence on a follow-up treatment for every case of malaria, so that every known source of infection is eradicated.

7. Cooperation between the provost marshal and the medical officers in the eradication of venereal disease.

8. Insistence on antityphoid and cowpox vaccinations for the command.

9. That a regular schedule of transport sailing be instituted. "Hope deferred maketh the heart sick," certainly applies here, not only to the enlisted personnel but to officers as well. Homesickness is a very real disease, and how many of the suicides which occurred in the brigade since it first took up its duties here, in the last analysis might be traced to it I am unable to say, but my belief is that it was one of the compelling reasons. The knowledge that, during a peaceful occupation, a soldier can see the date for his departure, gives him a mental anchorage that should not be disturbed.

10. That the easiest, best, and quickest method of transporting patients in a tropical country is by airplane, and future hospitals, if possible, should be located near a landing field or have a landing field of their own.

The year has passed, and now to the history of the marines in Santo Domingo can soon be written the word "finis."

The medical history of the men composing it can only be concluded when taps is sounded over the last survivor in some vast cemetery of a busy city or in the seclusion of a country graveyard, and what the toll from known or unknown diseases contracted here will be, is known to the angel of death, and his records are not open to our inspection.

Our memories of the island will not be clouded by remembrances of deadly epidemics, but of a country to which nature was kind, and where a rational mode of living made existence easy.

NOTES AND COMMENTS.

The long, narrow, tropical island of Java has a population of some 35,000,000 people. By far the greater part of this great aggregation of human beings is made up of peasants, simple folk, untroubled by intellectual turmoil, living always on the bare verge of existence, and utterly unfitted, either individually or collectively, to resist or survive the great epidemic diseases. In November, 1910, plague gained a foothold in that populous country, but the spread of the disease has been slow. The principal affected areas have been the mountain districts.

Three species of rats were found by the Dutch civil medical service in definite association with the native population. *Mus rattus griseiventer*, the gray-bellied black rat, is the house rat proper of Java. Its normal habitat is in the roofs, bamboo timbers, and other harbor-age afforded by the native methods of house building. This rat can not live in the open in competition with the other prevailing species. Once got out of the houses, and kept out, the species rapidly disappears. It is a highly effective plague carrier, and its flea is the *Xenopsylla cheopis*, the plague conveyer par excellence.

In contrast to *Mus rattus griseiventer* is the field rat of Java, *Mus rattus diardii*. It is partly dependent on man, in that it feeds mainly on his rice crops, but it does not come into houses. It is capable of being infected with plague, but is not an important factor in its dissemination. Its flea is the *Pygiopsylla ahalae*, a large, slow-moving flea, which is not an active plague carrier.

The third rat in Java is *Mus concolor*. Normally a field rat, it invades the native houses when *Mus rattus griseiventer* has been driven out. It is an active plague carrier, as its flea is the *Xenopsylla cheopis*.

The problem which confronted the officers of the Dutch civil medical service was to break the contact between the plague-carrying rats, their fleas, and the native population. It was assumed as a basis of operation that all native houses in the infected area should be so modified in respect to structural conditions that *Mus rattus griseiventer* or *Mus concolor* could not occupy them unobserved. One familiar with the bamboo house of the Tropics can readily understand the difficulty of making it ratproof. How the medical officers of Java solved this problem is told in an article on "Plague control

in Java," by Doctor Elkington, which appeared in a recent number of *Health*, a monthly journal issued by the Commonwealth of Australia. Speaking of the method of ratproofing employed, Doctor Elkington says:

"The vast majority of peasant houses in Java are built with bamboo plates, studs, and rafters, a grass ('Atap') roof, and walls of woven bamboo laths. At one end of the single apartment is an elevated platform—the 'bali-bali'—on which the inmate sleeps. It is usually composed of the omnipresent bamboo. A few simple presses and shelves complete the furnishing. The house rats live in the roof and the large bamboo timberings, gnawing out the joints of the bamboo to secure passageways or harborage. In a few hill districts houses are built of mud bricks, with tiled roofs, but these are relatively infrequent.

"The principal nesting places are above the ridge pole, in the hips of the roof (where a peculiarly shaped structure known as a 'squirrel tail' is inserted to shed the rain), in the rafters and plates, and about the bali-bali. The grass roof is thick and stout, a necessary feature in this country of heavy rainfall, and provides unending nesting space and nest material. It was necessary in effect to reconstruct the houses, and by last advices about three-quarters of a million houses have been so reconstructed.

"Grass roofs being obviously inconsistent with plague control, the native industry of tile making was encouraged by the Government and extended on a large scale. House timber is a rare and costly commodity in Java. A series of careful experiments were therefore carried out in order to discover methods of employing bamboo in a manner which would prevent its use by rats. It was found that by cutting a slot in the top joints of studs the resulting opening enabled rat passages to be detected at once. This seemingly minor detail is in reality one of the most important features of the whole work, for it prevents the rats from forming covered passageways to the roof. By plugging the ends of rafters and exposing their undersurfaces their use as harborage or runways was prevented. The ridge pole was shaped off to an inverted V to permit observation from below. After removal of the grass roof the new tiled roof was whitewashed underneath and lighting spaces were left to allow the whole undersurface and roof timbers to be viewed clearly. The 'bali-bali' supports were slotted, the front removed, the platform kept away from the walls, and presses raised from the ground to permit access underneath. If insufficient tiles were available at the time the grass roof was stripped down, cleaned of rats and fleas, the framework reconstructed, and the cleaned roof material replaced as a temporary measure. For mud houses similar ingenious methods were adopted. The use of bamboo for certain timbers in new houses was forbidden."

The appearance of the Atlantic Medical Journal marks a new era in medical journalism in the East. It combines and continues the journals of the medical societies of Delaware and Pennsylvania. We trust it will receive the support deserved by the worthy Pennsylvania Medical Journal, which it supplants. The first issue contains the following on bismuth in the treatment of syphilis, a subject which should be of interest to many naval medical officers:

"Sazerac and Levaditi in 1921 and 1922 reported the results of their experiments on bismuth compounds—bismuth ammonium citrate, lactate, subgallate, oxyiodogallate, and sodium and potassium tartro-bismuthate, in the treatment of rabbit syphilis. They observed that these salts of bismuth possessed a spirocheticidal action. The least toxic and most effective was sodium and potassium tartro-bismuthate, which they proposed for treating human syphilis, and were the first to employ, using it in an oil suspension by intramuscular injections.

"Subsequent to this study they reported equally favorable results in the treatment of rabbit syphilis with precipitated bismuth as with sodium and potassium tartro-bismuthate. The compound was injected in oil suspension. It, therefore, appears that the metal bismuth is the active spirocheticidal agent in bismuth compounds employed in the treatment of syphilis.

"As a result of the elaborate researches of Sazerac and Levaditi the clinical use of bismuth as an antisyphilitic drug has been made possible. The favorable results reported by them in the treatment of human syphilis with sodium and potassium tartro-bismuthate were confirmed first by Fournier and Guenot, who reported on its employment in the treatment of 200 syphilitic patients in different stages of the disease. Other reports, mostly French, have since appeared, until now a considerable number of syphilitic patients in all stages of the disease with diverse manifestations have been reported treated with the drug. In most of these reports, sodium and potassium tartro-bismuthate in an aqueous solution and in oil suspension were used.

"The foregoing reports show that bismuth is therapeutically active when employed in the treatment of human syphilis.

"Sodium and potassium tartro-bismuthate is administered solely by intramuscular injection. The drug is very toxic when administered intravenously in rabbits. It is administered either in an aqueous solution or an oil suspension; the former in doses of 0.1 gram in 1 cubic centimeter every other day, the latter in doses of 0.2 gram in 2 cubic centimeters of oil every fourth day. Most French writers favor the oil suspension of the drug, since it is considerably less painful.

"A course of treatment consists of a total administration of 2.5 to 3 grams of the drug given in the course of six to eight weeks. A rest period of about one month is instituted, then a repetition of this treatment until the Wassermann test is maintained negative.

"Spirochetes disappear from the surface of open syphilitic lesions usually 24 hours after the administration of 0.2 gram of the drug. Lesions of primary, secondary, and tertiary syphilis involving the skin and mucous membranes involute after a total administration of the drug ranging in amounts from 0.4 to 1.5 grams.

"The 4-plus Wassermann reaction of most patients in early secondary syphilis, previously untreated, and in the late secondary stage becomes negative following the total administration of bismuth in amounts ranging from 1.5 to 3 grams. The 4-plus reaction of primary syphilis becomes negative after a lesser amount of the drug and is somewhat proportional to the duration of the chancre. The 4-plus Wassermann reaction of tertiary syphilis requires varying amounts of bismuth treatment and can not arbitrarily be stated.

"The initial untoward reaction of bismuth is a foul breath and gingival blue line which is indistinguishable from that seen in plumbism. These reactions may appear following a total administration of 1.5 gram of bismuth. This, however, is exceptional. They usually appear following the administration of about 2.5 grams. Depending upon the intensity of bismuth therapy, the foul breath and the gingival blue line forecast the appearance of stomatitis and are associated with it. The incidence of stomatitis is intimately associated with the intensity of bismuth treatment and the hygienic condition of the mouth of the patient treated.

"Other untoward reactions are chills and fever occurring soon after an injection of bismuth, loss of weight, anorexia and malaise which may appear after prolonged treatment with bismuth. Less common reactions are polyurea, enteritis, and cutaneous reactions. Bismuth, as employed in the treatment of syphilis, apparently does not exert a nephrotropic action.

"It is known that relatively enormous doses of bismuth can be taken by mouth without producing signs of intoxication. This is probably due to the fact that very little is absorbed by the digestive tract. Although at times following oral administration of large amounts of bismuth signs of intoxication may occur, these signs also occur following absorption from wounds and when injected in the form of Beck's paste. Absorption is more rapid following the therapeutic use of bismuth by intramuscular injection. It is logical to believe that following this treatment any of the symptoms of bismuth poisoning with which we are familiar may appear. There is doubtless much to learn regarding the untoward reactions from the prolonged administration of bismuth by intramuscular injections.

The bismuth therapy of syphilis is too recent to have given us full information in this regard. This therapy must still be regarded as in the experimental stage not only concerning the effectivity of the drug as an antisyphilitic agent but also regarding its toxicity. It is, therefore, a matter of considerable importance that one practicing bismuth therapy of syphilis should be cognizant of the symptoms of bismuth poisoning and to watch for the appearance of these symptoms. In the bismuth therapy of syphilis, as in the treatment of any infectious disease, the principle in therapeutics, namely, the importance of treating the patient as well as the disease, should not be neglected.

"The advantage of having another active antisyphilitic drug in the treatment of human syphilis is obvious. Bismuth therapy is particularly advantageous in the treatment of syphilitic patients who are hypersensitive to arsphenamine so that the use of the latter drug is restricted, or contraindicated.

"Another possible advantage of bismuth in the treatment of syphilis which is of considerable importance, although based upon theoretical considerations, concerns the occurrence of neurorecidive following the use of arsphenamine. The baneful action of irregular or lapsing treatment with arsphenamine is well known. Such treatment greatly increases the incidence of early neurosyphilis. Ehrlich's explanation of this phenomenon is perhaps the one generally accepted. He explained the occurrence of neurorecidive upon an immunologic basis. He pointed out that in these patients the greater number of spirochetes are destroyed by the powerful spirocheticidal action of salvarsan. So rapidly is this accomplished that the usual tissue immunity which develops as a result of contact between parasite and host is lacking. As a result, a small focus of spirochetes in the tissue of the central nervous system which may escape the action of salvarsan develops in the susceptible host with great rapidity and severity. In other words, a few injections of arsphenamine, the cessation of all other treatment, inhibits the consummation of immunological responses of the host to the parasite and doubtless produces a condition analogous to that existing in the primary incubation period in which there are spirochetes and no immunologic reaction.

"Bismuth, on the other hand, by reason of a spirocheticidal action less energetic than arsphenamine and perhaps by virtue of intramuscular administration, does not, in all probability, inhibit immunologic reaction of the host to such an extent as it is thought arsphenamine does. One would, therefore, expect a lessened incidence of early neurosyphilis following irregular and lapsing treatment with bismuth.

"It is a significant fact that the known spirocheticidal drugs are heavy metals or their salts—mercury, vanadium, antimony, and bismuth. Arsenic is no exception to this, since the metal arsenic, *per se*, is not spirocheticidal. Moreover, arsenic, antimony, vanadium, and bismuth are in the same group of periodic arrangement of the elements. A priori, it would be interesting to know if other closely allied heavy metals, for example thorium and other allied metals or their salts such as cerium, tin, germanium, and tungsten, possess spirocheticidal activity."

Methyl alcohol or methyl hydroxide, which is commonly known as wood alcohol, is a clear, colorless, poisonous liquid obtained by the distillation of hardwoods.

On account of the large number of casualties attributed to drinking liquor containing wood alcohol, the importance of surrounding its use with every precaution to protect human life has attracted attention for many years, and as a result numerous protective and restrictive measures have been adopted. One of these measures is the proposal to discontinue from usage the name "wood alcohol" and use the scientific term "methanol."

The term "methanol" came into scientific or chemical usage as a result of the action of the International Conference of Chemical Nomenclature which met in Geneva, Switzerland, in April, 1892. One of the resolutions adopted at this conference was as follows:

"The alcohols and phenols will be called after the name of the hydrocarbons from which they are derived, terminating with the suffix 'ol'; as, for example, methanol, ethanol, etc."

Following this conference, the term "methanol" found its way into German textbooks. Although the report of the Geneva conference was published in 1893, the term methanol did not come into favor in the American chemical profession until 1920. In that year the late Dr. Charles Baskerville published several articles wherein he advocated general adoption by chemists of the correct scientific term "methanol." (See "Wood alcohol no longer; hereafter methanol," *J. Ind. Eng. Chem.*, 12 (1920), 910; and "Some chemical aspects of the wood alcohol problem," *N. Y. Med. J.*, 111 (1920), 580.)

The American Chemical Society and the National Wood Chemical Association have adopted the use of the term "methanol," and it is to be found in the *New Standard Dictionary*. It is also used in the leading chemical journals.

The subject is of such universal importance that the suggestion is made that all interested persons cooperate in the effort to establish the name "methanol" for the better protection of those who are not educated along chemical lines.

Maj. Gen. Sir William Boog Leishman, K. C. M. G., C. B., of the Royal Army Medical Staff, has been appointed Director General of the Royal Army Medical Service to take effect on July 29, 1923. Although his name is familiar to every medical officer of the United States Navy through his discovery of the causative organism of kala-azar, the details of his military career may not be so well known. From the *British Medical Journal* we learn that Sir William Leishman was born in Glasgow on November 6, 1865, the son of the late Prof. W. Leishman, and was educated at Westminster and at the University of Glasgow, where he graduated M. B. and C. M. in 1886. He entered the army medical department, as it was then called, as surgeon, on July 27, 1887, passing fifth into Netley. He became major R. A. M. C. after 12 years' service, and on April 15, 1905, was promoted to brevet lieutenant colonel in recognition of his services and of the distinction he had obtained in original investigation and research. On December 11, 1911, he became substantive lieutenant colonel; on October 15, 1912, brevet colonel; colonel on March 1, 1915; and major general on October 24, 1918. Three years after obtaining his commission Captain Leishman (as he then was) went to India, where he served for six and a half years. He took part in the Waziristan expedition in 1894-95, and received the medal and clasp. He held the appointment of staff surgeon to Sir George Wolseley at Lahore, and did a considerable amount of work in bacteriology. His researches in connection with kala-azar are well known. The parasite was first observed in 1900, but Leishman did not publish his discovery until 1903, when the same observation had been made by Lieut. Col. Charles Donovan, I. M. S., afterwards professor of pathology in the Madras Medical College. On return to England Sir William Leishman was posted to Netley, where he worked at bacteriology in Sir Almroth Wright's laboratory. He was assistant professor of pathology at the Medical Staff College and R. A. M. College from February 1, 1903, to January 31, 1910; he was then appointed professor of pathology at the R. A. M. College, which post he held until January 31, 1914. When war broke out he was War Office expert on tropical diseases on the Army Medical Advisory Board. He was sent to France in 1914 as adviser in pathology, which post he held until he was brought to England in April, 1918; he was appointed director of pathology at the War Office June 1, 1919. He was created a knight in 1909, C. B. in 1915, and K. C. M. G. in 1918; he was elected a Fellow of the Royal Society in 1910, and has received honorary degrees from the Universities of Glasgow and McGill. He was president of the Society of Tropical Medicine and Hygiene in 1912, and of the section of tropical medicine at the annual meeting of the British Medical Association at Brighton in 1913.

At the royal naval hospital at Haslar, which is on the water's side, close to Gosport, in view of Spithead, and about a mile or two from the town of Portsmouth, is concentrated much of the activity of the Royal Naval Medical Service in England. The following comment which appeared in a recent issue of the British Medical Journal recalls the beginning of this famous institution:

"In the good old days little provision was made for the care of sick and wounded sailors. After the Battle of La Hogue in 1692 many wounded were brought to Portsmouth, and 50 surgeons sent down from London to look after them. Queen Mary made arrangements for some to be treated in the London hospitals of St. Bartholomew and St. Thomas—the only ones of their kind at the time. Orders were also given for the palace at Greenwich, commenced by Charles II, to be completed and used as a retreat for disabled seamen.

"In 1713 we hear of a 'Fortune Hospital' near Gosport, where sick and wounded were treated under contract between Nathaniel Jackson and the Lords Commissioners of the Admiralty. Similar contracts were in existence in the various ports up to the middle of the eighteenth century. Owing to difficulties frequently arising from these contracts it was decided on the earnest recommendation of the Earl of Sandwich to found a royal hospital at Gosport. The site chosen was known as Hazelar, or Haslar, or Hasleworth. At this spot on a map of 1603 a castle is marked 'Haselworth,' but the place is called 'Haslehorde' in the 'Usages of Portsmouth' as far back as the fourteenth century.

"Horace Walpole says the architect was Theodore Jacobson. It is of the 'palace' type after the model of a portion of Greenwich Palace designed by Inigo Jones. Local tradition saith that the bricks were made on the spot—hence Clay Hall in the immediate vicinity—and that there are as many bricks in the foundations as there are above ground. The building was commenced in 1746, the front block completed in 1754; the wings were added in 1762, and the chapel on the west side was opened in 1763. It is said to have cost £90,000. The quadrangle of the hospital measures about 7 acres; the area enclosed within the boundary walls is 58 acres.

"The hospital was originally intended for 1,800 beds, allowing an air space of 600 cubic feet a head; during the Crimean War it was made to hold 2,000, but the numbers have since been limited to 1,200. Patients on being landed at the pontoon in Haslar Creek are brought up to the hospital by a tramway running right up to the main entrance. The pavilion opposite the main entrances reminds us of the old press-gang days. Here was posted in those days a strong guard to prevent desertion.

"Within the hospital there is an interesting museum of pathology and natural history. Amongst the osteological collection are some delicate skeletons set up by a curator who had but two fingers on one hand and none on the other. There are also some rare bird skins.

"The hospital is well equipped and the medical school well up to date. All medical officers entering the royal navy have to pass through its portals."

In the December issue of the *British Journal of Surgery* appeared the Vicary lecture for 1922, delivered before the Royal College of Surgeons of England by Mr. W. G. Spencer, who chose as his subject "The Anatomical Delineations of Vesalius." The Vicary lecture, instituted in 1919 by the Barbers' Co. of London, commemorated the fusion with the Guild of Surgeons, upon which ensued the making of special provision for instruction in anatomy of the members of the united company. Thomas Vicary, we learn from an account of Mr. Spencer's lecture in the *British Medical Journal* of February 24, 1923, who was sergeant surgeon to King Henry VIII, was four times president of the united Company of Barbers and Surgeons, and it was to him that Henry VIII handed the act of incorporation, as depicted in the famous painting by Holbein. He died in 1561, having continued in the office of sergeant surgeon under Edward VI, Mary, and Elizabeth. In 1554 he was appointed surgeon to Philip II, to whom also Vesalius, for very different reasons, was surgeon at the same time. The celebration in 1914 of the quadricentenary of the birth of Vesalius was interrupted by the outbreak of war, but in May last year the foundation of the University of Padua, where Vesalius taught while composing his books, was commemorated. The great Italian artists aimed to reach the height attained by the Greeks, and before the time of Vesalius had pursued to some extent the study of anatomy by dissecting the human body. Anatomy owes much to them, for their influence helped to break down the objection to permitting the examination of the human body after death; gradually the prejudice yielded to the influence of reason, and Vesalius placed upon the monument on which the second skeleton figure leans the inscription, "Man's spirit lives, all else death's hand shall claim." Vesalius wrote an epigram describing the difficulties he had to overcome, and it has been turned into English—apparently for the first time—by Miss Joyce Lowe. Mr. Spencer considered it beyond doubt that all the illustrations in Vesalius's book were from his own designs, though the names of the draftsmen or engravers were nowhere definitely mentioned. The frontispiece, the portrait, and the vignettes give expression to the idea Vesalius had of the way

anatomical instruction should be given. The drawings of the nude figures, of the muscles, and of the skeleton all disclosed the same purpose, which was to represent the living body in active movement. Vesalius had a wider aim than to instruct students of medicine and art alone; he thought every educated man should possess a knowledge of anatomy and physiology, as he indicated in the letter dedicating the *Epitome* to Prince Philip: "You will think it base and unworthy that, while such varied courses of study are pursued, the composition of the body which accompanies us through life should be a secret from us; that man should be absolutely unknown to himself; and that we do not examine the construction of the organs formed so perfectly by the Almighty Designer of the Universe. The vital activities of these organs by which everything is accomplished we confine ourselves merely to wondering at." The drawings representing horizontal sections through the human brain were, Mr. Spencer said, of peculiar interest, because it could be demonstrated that the artist had before his eyes the anatomical preparations and drew what he saw; and further, that the sections were made in series from the same brain. The diagrams of nerve and brain and artery included in the *Epitome* were intended to be cut out and superimposed upon the nude female and other figures. This Mr. Spencer made plain to his audience by placing the corresponding lantern slide one over the other in the epidiascope. These diagrams, it was pointed out, were closely related to the *Tabulae Evelianae* preserved in the college museum. Before the introduction of methods of preserving anatomical material from putrefaction and of injecting blood vessels, nerves and blood vessels were dissected out and spread on boards for inspection and drawing; after being varnished over they could be preserved. Evelyn's account shows that a century after Vesalius, his successor in the chair of anatomy at Padua, Vesling, supervised the preparation for Evelyn of human nerves and blood vessels by the same method as had been adopted by Vesalius when preparing his diagrams. Mr. Spencer exhibited copies of all the "Works" of Vesalius from the libraries of the College of Surgeons, the College of Physicians, the Medical Society, and the Royal Society of Medicine.

In reference to the care with which hospital corpsmen should be selected, the commanding officer of a large naval hospital makes the following comment in his annual sanitary report:

"The general character of the present hospital corpsman is about the same as it has been for some time; there are many very good ones, some bad, and a lot indifferent. It has not seemed to make any

difference whether their course has been six weeks or six months, nearly all of them have to be given additional instruction when they come to a hospital. They all need practical experience which can be got nowhere but in a hospital.

"It is believed that more care should be exercised in the selection of men for this service, and it should be impressed on the members of the recruiting parties that they are getting the men who may be called upon to nurse them during a long illness, and that their own lives may depend upon the intelligence of these men. It is not only the reputation of the Medical Corps that is at stake but the lives of the line officers, enlisted men of the line, and the lives and men of the other corps as well—in fact, the efficiency of the whole service depends upon the efficiency of the Medical Corps. As soon as that efficiency is destroyed, we are bound to revert to the conditions which existed in the middle of the last century, conditions to which no thinking or knowing person would ever wish to revert. If these facts were constantly kept in the mind of the recruiting officers they would probably get more men, and they would be the best, instead of the worst or the mediocre, and we would not have to discharge any as constitutionally inferior, as we have had to do in at least one instance in this hospital recently. Others of these corpsmen have been discharged with bad-conduct discharges, by court-martial, and some are just generally worthless, but that is so with all groups of human beings. There is probably no greater proportion among the members of the Hospital Corps than in the line, although it is more important that the men in the Hospital Corps should be bright and intelligent than for similar ratings in the line."

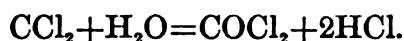
In this section of the BULLETIN of February, 1923, there appeared a comment on pyrene-gas intoxication. The following abstract of an article entitled "Carbon tetrachloride as a fire extinguisher," by Jacques Fohlen, which appeared in a recent number of *Technique Moderne*, is of interest in this connection:

Phosgene (COCl_2) is formed by heating carbon tetrachloride at temperatures from 200°C. to 800°C. In dry air heat can react with carbon tetrachloride according to the equation $2\text{CCl}_4 + \text{O}_2 = 2\text{COCl}_2 + 2\text{Cl}_2$, but the yield is very small, the maximum being 0.4 of 1 per cent, although the theoretical yield is 64 per cent.

In the presence of combustible organic matter the following reaction takes place with a maximum yield of 0.75 of 1 per cent. The yield is theoretically 128 per cent:



In the presence of moist air the following reaction takes place with a maximum yield of 64 per cent :



Fohlen concludes, therefore, that fire extinguishers containing carbon tetrachloride should only be used in well-ventilated compartments; that they should not be used in the presence of moist air; and that after their use water should not be sprayed on objects to cool them off.

Warthin and Starry, maintaining that morphological differentiation of spirochætes by the dark field is often impossible, that no simple method of staining spirochætes is known and that the India-ink method may be dangerously misleading, urge the use of silver-impregnation methods and present their technic of demonstrating spirochætes in cover-glass smears as the surest and safest diagnostic method yet devised.

The spirochætes in the smears appear black against a light background. Since there takes place a deposition of silver on the surface of the organisms, their apparent size is increased, but morphological characteristics are not obscured.

Method: Note that all reagents must be chemically pure and that clean porcelain or glass ware exclusively should be used.

1. Prepare smears on perfectly clean No. 1 cover glasses.
2. Dry thoroughly in air.
3. Fix in absolute alcohol three to five minutes.
4. Wash in distilled water, two changes.

If it is desirable to clear a too opaque background, the smear at this stage is immersed in concentrated hydrogen peroxide for 5 to 20 minutes and then washed thoroughly in distilled water.

5. Rinse the cover glass bearing the smear in 2 per cent silver nitrate, and apply to its smear side a perfectly clean cover glass also rinsed in the silver nitrate solution. Place the apposed cover glasses, setting them carefully on edge and in such manner as to avoid separating them, in a wide-mouthed dark bottle containing enough 2 per cent silver nitrate for the level of the fluid to come about half way up the cover glasses. Place in incubator for one to two hours. Then remove cover glasses and separate them.

6. Place the cover glass bearing the smear smear side up in the reducing solution for 30 seconds to 2 minutes. The reducing solution is made as follows:

Dissolve in order—	
2 per cent silver nitrate solution.....	c. c. 3
Warm 10 per cent aqueous gelatin solution.....	5
Warm glycerin	5
Stir in—	
Warm 1.5 per cent agar suspension.....	5
Just before using add, stirring vigorously—	
5 per cent aqueous hydroquinone solution.....	2

The agar suspension is made as follows: Break up 1.5 grams of agar and soak in 20 to 30 cubic centimeters of distilled water until saturated. Pour off water and wash the agar with several changes of distilled water. Add 100 cubic centimeters distilled water and bring to boiling point, stirring constantly. Allow to cool, shaking occasionally, and finally, when agar begins to set, shake violently to break it up thoroughly. Placed on a paraffin oven, the suspension remains just fluid enough to run.

7. When the reduction is complete remove smear and rinse in 5 per cent sodium thiosulphate solution.

8. Rinse in distilled water.

9. Absolute alcohol, xylol, balsam.

If the stained smears are to be preserved, they may, following step 8, be toned in:

Ammonium sulphocyanide	gm.	6. 25
Tartaric or citric acid.....	gm.	. 50
Sodium chloride	gm.	1. 25
Distilled water	c. c.	250. 00
Solution of gold chloride (1:100).....	c. c.	6. 25

After a short time in this solution (5 to 15 minutes) the stain turns to a blue-black color. The smears are then washed in distilled water, dehydrated and cleared, and mounted in balsam.

Recent numbers of the Archives für Schiff's und Tropen-Hygiene, we are told in the Lancet of February 24, 1923, have contained interesting details of further work on the new synthetic trypanocide Bayer "205," showing the possibilities and limitations of the remedy. In the issue for October, 1922, Prof. W. Mollow, of Sofia, reports a case of kala-azar contracted by a Bulgarian prisoner of war in Greece. Taken prisoner in September, 1918, he was in Larissa in June, 1919, when he and several of his fellow prisoners had to go to bed with a fever (from which the Greek population seemed also to suffer), for which they took a great deal of quinine without benefit. However, by the summer of 1920 he had recovered, and reached home in that November well but without appetite. Ten days later he again suffered from shivering and pyrexia, which again persisted in spite of quinine. In January, 1921, he noticed that his spleen was enlarg-

ing and becoming painful. In February he bled frequently from the nose and gums, and small hemorrhagic lesions appeared on the legs. He gradually became bedridden, the spleen enlarging as the rest of his body wasted. Small painful papules appeared on his face, arms, and legs, breaking down into chronic ulcers. In July, 1921, he was taken into hospital when it was noted that he was anemic; hemoglobin, 30 per cent; red cells, 2,550,000; white cells, 2,500; polymorphs, 75 per cent; lymphocytes, 25 per cent. There was a trace of albuminuria; there were no casts. The long history of pyrexia uninfluenced by quinine, the notable enlargement of the spleen, the hemorrhages, the ulcers, and the cachexia caused the disease to be regarded as kala-azar. On August 13 he was given intravenously 0.2 gram of Bayer "205," the rest of the solution at the time prepared being given to another patient, who suffered no inconvenience. This patient, however, shivered 20 minutes later, and in two hours had bleedings from the nose and gums, vomiting, and bloody stools. He said he had frequently had similar attacks, though none so severe. Ultimately his heart failed and he died at 4 a. m. the following day. It was supposed that the patient was too weak to stand the injection. Leishmania was seen in the blood from the spleen taken immediately after death. At the post-mortem 24 hours later they were found only in the bone marrow. The spleen was $12\frac{1}{2}$ inches long and weighed 6 pounds, and there was peritonitis on the posterior and anterior surfaces, with small abscesses here and there.

In the November issue Doctor Migone and Dr. T. Osuna, of Ascuncion, in Paraguay, describe the eminently successful results obtained by the use of Bayer "205" in the curative and prophylactic treatment of the trypanosome disease, mal de caderas, among the horses on the great ranches of Paraguay. They, in the first place, insist that it is essentially necessary for every large farmer to have some one by him skilled in the use of the microscope, to be able to detect the disease in the early stages by recognizing the trypanosomes in the blood. Histories are given of horses slightly affected and of horses practically dying which were cured by the injection into their veins of 2, 3, and 4 grams in a 10 per cent solution in normal saline at weekly intervals. The horses recovered and became fit for work. Some were even sold. They did not relapse. Two grams is a prophylactic dose. The very carefully observed results have turned out so well that mal de caderas, which formerly decimated the ranches, may now be said to be under control, so that a new and happier future has opened before the stock breeder.

The use of the defecation reflex through the spinal cord is a novel aid in the treatment of constipation advocated by Prof. W. A. New-

man Dorland, of Chicago, in the March, 1923, issue of the *International Clinics*. This reflex can be artificially excited in a very large proportion of patients, within 15 to 20 seconds, by resorting to the following procedure: A folded sheet of toilet paper is laid over the anus; the patient relaxes the sphincters completely and bears down, while with the index finger of the right hand he gently makes a series of rapidly broken compressions, about 10 or 12 or less, directly over the anus. On ceasing this motion there will immediately follow a desire to defecate, which should be aided by a gentle bearing down. It has been estimated that the period of time elapsing between the anal stimulus and the initial reflex response is about 0.02 second. It must be borne in mind that holding taut the rectal sphincters will completely abolish the defecation reflex, since this involves a strong contraction of all the muscles of the pelvic floor, which action results in immediate inhibition of the defecation reflex. Doctor Dorland believes that if this simple procedure is carefully carried out at a regular daily hour, preferably in the early morning, the average case of constipation will be relieved and a regularity of body habit established that will work wonderfully for the physical benefit of the patient. Laxatives, purgatives, and cathartics undoubtedly have their place in the treatment of constipation, but their use should be restricted as largely as possible and should not usurp the preferable methods of regulation of the bowels by the adoption of carefully selected diets, the observance of proper hygiene, the performance of daily exercise of various appropriate kinds, and the cultivation of the normal body reflexes.

The recent death of Roentgen should not make us oblivious to the fact that his epoch-making discovery has been distinctly a two-edged sword in the digestive field. Dr. Thomas R. Brown, of Baltimore, believes that in the case of a great many physicians the X rays have consciously or unconsciously persuaded them to be much less thorough in their careful analysis of the case and in their clinical studies, and this, we feel, is very deplorable, because from X-ray studies alone diagnosis should not and in many cases can not be made. It is to Doctor Brown peculiarly distressing to see a diagnosis founded on very careful clinical study of the case overthrown by a few words from a radiologist, who often is untrained clinically and only too frequently has not had a broad experience in reading X-ray plates. While it is obviously easy to fluoroscope a patient and to take X-ray plates, nothing is more difficult than to explain the pictures on the screen or to interpret the abnormalities of form or position as manifested in the plates. "I would rather," said recently a celebrated Italian internist, "have no X-ray examina-

tion in a case than X-ray plates interpreted by anyone other than a master in this field." To regard the X ray as the court of last resort in diagnosis is fundamentally wrong except in gross conditions which can, in the majority of cases, be diagnosed just as definitely by other means. Except in such cases the X-ray diagnosis can rarely be definite; should only suggest various possibilities the probability of which must be dependent upon other features of the case, as determined by careful history taking, a thorough clinical examination, and the use of various special tests. The X ray is but one of many means of reaching a diagnosis, none of which, except in occasional instances, is capable of furnishing the diagnosis per se, but each of which should be used in proper proportion in reaching a probable or, in rare instances, an absolute diagnosis. To show the difficulty even in the hands of experts, Doctor Brown suggests the advisability of having the same case studied under exactly the same conditions by various radiologists. In certain cases all will agree on the diagnosis. These, as a rule, are the easy cases, diagnosable by other means; but in a considerable proportion of cases very different diagnoses will be furnished by different men, all honest, all experienced, all capable in this field. The pictures are definite, the images on the screen are definite, but the interpretation always is a question of subjectivity and must differ unless the picture is perfectly obvious.—International Clinics, March, 1923.

If the intestinal flora has a definite biological significance in relation to health and if the maintenance of this biological interrelationship depends upon the diet, then the study of these interrelationships must necessarily begin in early childhood, when the diet approximates more nearly the normal than at any other time of life and at which time the metabolic processes are perhaps harmonized best. If an infant is breast fed, the intestinal flora is found to be dominated by an aciduric organism, *B. bifidus*. Later when the child is weaned from the breast or is bottle fed the percentage of *B. bifidus* falls and there is a rise in the percentage of *B. acidophilus*, perhaps a mutation form of *B. bifidus*, which is better suited to meet the conditions than *B. bifidus*. It is safe to assume that both organisms are aciduric forms normal to the intestinal tract of the infant and child, since they can be demonstrated with such constancy in the stools of children. As the diet includes a higher percentage of starches and proteins, the flora becomes more complex; that is, *B. coli* makes its appearance in large numbers, as well as such organisms as *B. aërogenes capsulatus*, gram-positive coccil forms, and putrefactive types. The increase of these forms naturally leads to a decrease of the aciduric types. Briefly, this is the transforma-

tion occurring ordinarily in the intestinal flora of civilized man as he grows up. Experiments and clinical observations have led to the following conclusions, which are summarized:

1. The character of the intestinal flora as well as its metabolism are influenced directly by diet.

2. Lactose, dextrin, fruit, and vegetable residue promote the growth of the aciduric types and if consumed in sufficient quantities will cause the intestinal flora to be dominated by those types.

3. The simplification of the intestinal flora is most successfully accomplished when other foci of infection in the teeth, tonsils, sinuses, respiratory tract, gall-bladder, and the upper digestive tract are removed. In fact, there seems to be a coexistence of these infections.

4. While a complex faecal flora may be present in an apparently normal and healthy individual, it does not signify that this apparent state of health is predicated upon the complex nature of this flora, but rather that the health picture is not as sound as it appears and that the well-being of the individual is being menaced constantly by this type of flora. On the other hand, an aciduric or simple type of faecal flora is found normally only in healthy intestinal tracts at a time when the organism is undergoing an actively constructive metabolic phase.

The researches concerning the intestinal flora are beginning to establish tangibly the value of this unique partnership between the human body and the protective microorganisms of the intestinal tract, and all the factors and influences which aid in maintaining a healthy intestinal flora are factors tending to prevent disease and prolong the health span of man.—Dr. N. Philip Norman, of New York City, in March, 1923, International Clinics.

Dax, of Limoges, France, calls attention in the March, 1923, International Clinics to the frequent association of diphtheria with typhoid fever, the diphtheria being too often overlooked or diagnosed too late for the antitoxin to be of any benefit.

The following summary of treatment as employed in the department of dermatology and syphilis at the College of Physicians and Surgeons, New York, was prepared by Dr. John A. Fordyce and is contributed by the division of venereal diseases of the United States Public Health Service:

Every lesion on the genitals should be regarded with suspicion and examined for the *treponema pallidum*. The earlier treatment

is begun the better the chance of preventing a general dissemination of the treponemata in the various organs of the body.

ABORTIVE SYPHILIS.

Abortive treatment means the treatment of a patient with a genital or extragenital lesion in which the treponemata pallidæ have been demonstrated by the dark field before the Wassermann reaction has become positive. These patients are given eight intravenous injections of arsphenamine of 0.3 to 0.5 gm. each (dosage according to sex, weight, and age of patient). The first three injections are given every other day in vigorous individuals where the drug is well tolerated, and the remaining five every five to seven days. This treatment is rather intensive but is worth while to prevent general dissemination of the disease. As a measure of safety a second course of six injections of arsphenamine is given after an interval of four to six weeks.

Wassermann tests should be made at stated intervals to determine whether the disease has remained localized. In a few instances where the test was negative and the diagnosis of primary syphilis was based on a positive dark field, the Wassermann reaction was found on the second or third examination to be positive although the patients had been treated immediately as outlined.

Patients who have never developed positive serological findings may be considered abortive cases and should be under observation for at least one year after discontinuance of treatment for monthly blood tests. Where a positive Wassermann develops during treatment, the latter must be carried out the same as in early secondary cases.

SECONDARY SYPHILIS.

A. Chancre with a positive Wassermann reaction only.

B. Chancre with skin and mucous membrane manifestations and a positive Wassermann reaction.

The treatment should be given in courses and must be carried out in a systematic manner. The patient should be instructed as to the importance of following this plan in order to obtain a cure.

Before the administration of arsphenamine it is usually advisable to give one or two injections of mercury to prevent a Herxheimer reaction.

First course.—(Intensive method.) This is employed where rapid sterilization is desired when the patient is a menace to his family and the community because of mucous membrane, lip, or other external lesions containing numerous treponemata.

The first three injections are given every other day, then every five or seven days until eight have been administered, dose 0.3, 0.5, 0.6

gram, according to sex, weight, age, and physical condition of the patient.

Mercury should be given during this course. Fifteen intramuscular injections of the salicylate, grains i to iss every seven days, or if a soluble mercurial is employed such as bichloridol, grains i every four or five days.

At the completion of the course a Wassermann test is made. Very often it is negative. Notwithstanding a negative result, the treatment is repeated after the patient has had a rest of four to six weeks.

Second course.—This consists of eight intravenous injections of arsphenamine, dose 0.3 to 0.5 gram at weekly intervals and 15 mercurial injections as in the first course. Four weeks after cessation of treatment the blood is examined. If it is positive, the patient is instructed to rest four to six weeks longer before beginning a third course of eight arsphenamine and 15 mercurial injections. Should the test be negative, a rest of three months is advised, followed by a course of 6 arsphenamine and 10 mercurial injections.

Under ordinary conditions the treatment as outlined above will reverse the positive serological findings and cure the patient, but complications may arise during the early period of syphilis, such as cerebrospinal involvement, which change the situation and alter the prognosis in each individual case. Patients with involvement of the central nervous system require treatment over a longer period, and where the ordinary methods fail to bring about a negative spinal fluid, intraspinal injections should also be given.—

TERTIARY AND LATENT SYPHILIS.

Patients in the tertiary or so-called latent stage are treated in practically the same manner as secondary syphilitics, except, first, they are not treated so intensively, and, secondly, iodides are used freely during the rest periods. It often takes years to obtain a negative Wassermann reaction in these cases, and the total amount of treatment required is very much greater than in secondary syphilis. Obviously, therefore, treatment can not be pushed with the idea of obtaining a negative result in a given time. Judgment must be displayed in arranging the intervals and amount of treatment to avoid arsenical poisoning.

Great care must be exercised in the treatment of patients with syphilis, and careful examination of the heart and aorta, lungs, kidneys, eyes, and nervous system must be made to detect organic changes. Special emphasis should be laid on careful routine examination of the pupils as pupillary changes are often the only objective evidence of involvement of the central nervous system in patients with tertiary syphilis.

Patients with organic disease do not tolerate intensive treatment of any kind, and syphilitic therapy must be administered with great caution.

ANTENATAL SYPHILIS.

In the treatment of syphilis during pregnancy great care must be exercised in the administration of our specific drugs. The ideal place to treat pregnant syphilitic patients would be in the hospital where all precautions could be carefully carried out. If the patient is treated in the office or clinic and permitted to go home she should be instructed to lie down on reaching home and remain in the recumbent position for at least four to six hours. Every precaution should be taken to prevent a reaction, for severe vomiting may stimulate uterine contractions and result in miscarriage. Weekly examinations of the urine should be made to determine the kidney function.

The treatment is given in courses of 6 neoarsphenamine and 10 bichloridol injections, using the continuous method—that is, first the neoarsphenamine and then the mercury; after four to six weeks' rest repetition. In this way the patient is not overtaxed by the drugs. Two courses of each are usually sufficient during the period of gestation and result in the birth of a healthy baby.

CONGENITAL SYPHILIS.

The treatment of infants and young children consists of intramuscular injections of neoarsphenamine (neutral) and mercuric chloride (bichloridol).

Here again emphasis is laid on two factors: First, the earlier the treatment is begun the more rapid the serological cure, and, secondly, treatment must be carried out in a routine manner in courses as follows:

Age.	Drug and dosage.	
	Neoarsphenamine.	Bichloridol.
	Grams.	Grains.
3 weeks to 6 months.....	0.1	$\frac{1}{8}$
6 months to 1 year.....	.15	$\frac{1}{4}$
1 year to 2 years.....	.15- .2	$\frac{1}{2}$
2 years to 3 years.....	.2 - .25	$\frac{1}{2}$
3 years to 5 years.....	.25- .3	$\frac{1}{2}$ - $\frac{3}{4}$

As in acquired syphilis the treatment must be individualized and the intervals lengthened or the dosage changed as indications arise.

The urine should be examined at frequent intervals, as occasionally a trace of abumin is found. This quickly subsides when medication is discontinued.

A course consists of 8 intramuscular injections of neoarsphenamine and 10 to 12 intramuscular injections of bichloridol not given together as in the case of adults, but one drug followed by the other. Two full courses, each with proper rest intervals regardless of a negative reaction, and possibly a third course of mercury are usually given. In very feeble infants, and in the presence of active syphilitic manifestations, it is advisable to begin with mercury, giving at least 4 to 8 injections before the administration of neoarsphenamine.

SPECIAL REMARKS.

First. Before receiving arsphenamine patients should be properly instructed regarding a cathartic the night before treatment, abstinence from food before and after the injection, and rest.

Second. Careful examination must be made of the heart, lungs, kidney function, etc., to gauge the amount of treatment that may be tolerated with safety, and the possible toxic effects of the drugs.

Third. Careful routine eye examination should be carried out early in the disease and repeated during the time of treatment.

Fourth. A lumbar puncture should be made to determine the presence or absence of cerebrospinal involvement.

Fifth. A patient should never be discharged as cured until the Wassermann test has been negative for at least two years after repeated testing. It is customary to give a provocative arsphenamine injection as a final measure. This consists of the ordinary intravenous injection of average dose with tests taken at intervals of 24, 48, 72 hours, 1 week, and 1 month. If these are negative and the spinal fluid is negative, the patient may be discharged as cured.

Sixth. A patient with positive findings in the cerebrospinal fluid should not be discharged even if the blood is negative.

Seventh. Care must be exercised in the future treatment of patients who have complications following arsphenamine, such as cutaneous and nitritoid reactions and jaundice. In some a change in the preparation may be tolerated; in others the same reactions occur. We must, therefore, rely on mercury and iodides.

CONTRAINDICATIONS TO ARSPHENAMINE THERAPY.

1. Marked organic disease of the heart and aorta, kidneys, and other viscera.
2. Degenerative changes of the blood vessels, arteriosclerosis, etc.
3. Extreme malnutrition and cachexia where other diseases are associated with the syphilitic infection.
4. Severe nitritoid reactions and cutaneous manifestations following the administration of the arsenicals.

5. Arsenical neuritis. While this condition is a rare one patients complaining of pain or dysaesthesias in the extremities should be investigated for a possible neuritis.

6. Jaundice the result of an arsenical intoxication. Pains in the joints developing during treatment are suggestive of a beginning jaundice.

JAUNDICE OCCURRING AS A COMPLICATION DURING THE TREATMENT OF SYPHILIS.

This complication is probably due to the direct action of arsenic on the liver, causing acute inflammatory changes in the liver cells and biliary passages, resulting in a blocking of the free flow of bile into the intestines.

The treatment consists of discontinuance of all arsenicals, free and forced elimination through the kidneys and intestines, and a fat-free and low-protein diet. Plenty of water, lemonade, sodium phosphate and cholagogue cathartics (such as Veracolate and Taurocol tablets with pancreatin and pepsin) should be taken.

It usually takes several weeks for the jaundice to develop, during which time the patient complains of digestive disturbances, lassitude, and pains of varying grade in the joints and extremities. Patients with jaundice should not be given the arsenicals for at least six to nine months after the attack, and then they should be administered very cautiously in small doses.

INDICATIONS FOR INTRASPINAL TREATMENT.

1. Rapidly advancing optic atrophy due to a basilar meningitis where intravenous medication has failed to control the progress of the disease. The indications for or against intraspinal treatment are determined by the spinal fluid formula.

2. Cerebrospinal syphilis where thorough intravenous and intramuscular medication has failed to bring about the desired clinical and serological results.

3. Cerebrospinal syphilis where patients do not tolerate arsphenamine intravenously.

(Cerebrospinal syphilis includes syphilitic meningitis, meningoencephalitis, meningo-myelitis, vasculitis, tabes, tabo-paresis, and paresis.)

METHOD EMPLOYED FOR INTRASPINAL TREATMENT.

The patient receives his regular intravenous treatment; 30 minutes later 50 cubic centimeters of blood are withdrawn in a sterile tube and placed on ice until the following day, when he is to be treated. The blood is centrifugalized, the serum pipetted into a

sterile tube, centrifugalized again to make certain that all the red cells have been thrown down, and pipetted into another sterile tube. The serum is then placed in an incubator at 56° C. for 40 minutes, after which it is ready for use.

The patient should be kept in bed at least 24 hours after each intraspinal treatment, instructed to lie flat without a pillow, drink water freely, and not leave his bed for any reason until the next day.

Intraspinal injections are given every two to four weeks, depending upon the reaction of the patient, for six to eight treatments. A rest period of two to three months follows, and then a similar course is given. The spinal fluid should be examined after each treatment.

The serological improvement is determined by the decrease in the lymphocytes, globulin, Wassermann reaction, and the character of the gold sol reaction.

BOOK NOTICES.

Publishers submitting books for review are requested to address them as follows:

The Editor,
U. S. Naval Medical Bulletin,
Bureau of Medicine and Surgery, Navy Department,
Washington, D. C.
For review.

Books received for review will be returned in the absence of directions to the contrary.

A MONOGRAPH ON GONORRHEA, by *A. Reith Fraser, M. D. (Aberd.)*, lecturer in venereal diseases, University of Cape Town; honorary visiting venereologist, New Somerset Hospital, Cape Town. Henry Kimpton, London, 1923.

The field of the venereologist has never been defined. This is unfortunate, for in no other special branch of medicine do the diseases with which he deals overlap and encroach on the domains of so many other special branches. This excellent account of gonococcal disease has been written from the viewpoint of the venereologist, and it is noted that complications which concern the gynecologist, the ophthalmologist, the neurologist, or the internist have been but briefly considered.

The work is a plea for the conservative treatment of gonococcal urethritis and for the management of gonorrhea as a general systemic disease instead of as a local specialized catarrh. As the author informs us in the preface, the production of his contribution has been impelled by a desire to throw over altogether stereotyped and oft-reiterated teaching which conflicts with clinical experience and to submit an account of gonococcal disease which will enable the student to make an efficient disposition of data—accepted, speculative, controversial, and experimental.

The author is to be congratulated upon his effort, for he has produced not only a very readable book but one which is intensely practical.

The work bears the earmarks of the author's originality. In its pages he unhesitatingly condemns accepted treatment and methods which do not produce the results expected.

The volume opens with a short but interesting discussion of the history of gonorrhea and the modern literature of the disease. This is followed by some necessary anatomical data and some histological and physiological considerations of the male generative organs. The bacteriology of gonorrhea, including staining methods and cultivation, vaccines, and the complement fixation test is adequately covered, as is the pathology of the disease.

After describing a systematic method of examining the patient, the author takes up the consideration of acute gonorrhea in the male and its treatment.

The prophylactic measures advocated are those in use in the United States Navy.

If the patient after contracting the disease is seen within 24 hours of the appearance of the discharge, the abortive measures as laid down by Ballenger, of New York, are recommended by the author. This treatment is as follows:

The patient first empties his bladder, and the glands and meatus are cleansed with alcohol, which is allowed to dry. Then 25 minims of a freshly prepared 5 per cent argyrol solution is injected into the urethra with a syringe and the meatus sealed with collodion. The solution is retained for at least four hours, when the collodion is removed with acetone. The patient then drinks large quantities of water so as to reduce the local hyperemia caused by the argyrol. This procedure should be continued twice daily for three days. Ballenger reports considerable success with this method.

Once the gonococci have penetrated the mucosa, efforts to evict them are attended with difficulty. "The treatment of gonorrhea," says the author, "always must test our clinical acumen and judgment, try our patience, and fully extend our ingenuity. We must recognize that it is utterly impossible to sterilize the infected urethra by means of antiseptics at our disposal. The infected urethral mucosa is an exquisitely delicate structure, devoid of elasticity and very easily damaged. This fact is overlooked by those who endeavor to eradicate the gonococcus by prolonged application of powerful 'antiseptic' solutions or by intraurethral maneuvers which require the constant passage of instruments. The added responsibility of incision and scarification of an infected surface, the traumatizing nose of urethral instruments on a fragile mucosa, and the extensive cicatrization which follows in the wake of curette and cautery have not been weighed in the balance against accepted principles of sound surgical procedure."

Realizing that we have no highly gonococcicidal drug at our disposal, the author, with reason, advocates the treatment of gonorrhea by irrigation, using a mild nonirritating antiseptic in the

earlier stages and a mild antiseptic astringent in the later stages. The solution should be heated to a temperature of 103° F. or 108° F. Very hot solutions will serve only to irritate the compressor muscle and may throw it into spasm.

For all acute cases and in the vast majority of chronic cases potassium permanganate may be used with unqualified success. It is used in solutions of 1 to 16,000 to not more than 1 in 8,000. Zinc permanganate in a strength of 1 in 12,000 to 1 in 6,000 is a mild astringent which may be alternated with potassium permanganate in the later stages with beneficial results.

The method of employing the irrigations recommended is as follows:

“(a) The reservoir, filled with a minimum of 3 pints of solution at a temperature of 106° F., is raised to a height of 5 feet above the level of the urethra if a two-way nozzle is being used and 2 feet in the case of a one-channeled nozzle. The clip on the rubber tubing is closed.

“(b) The patient may be in the upright, sitting, or recumbent position.

“(c) The prepuce, glans, and meatus are thoroughly cleansed with alcohol.

“(d) The prepuce is retracted and the penis grasped between the middle and ring fingers with the forearm in the supined position, the back of the hand being toward the abdomen. The lips of the meatus are held apart with the forefinger and thumb.

“(e) The tip of the nozzle is inserted just within the meatus, the clip removed from the tubing, and the fluid allowed to flow into the urethra. If a two-way canula is used, the return channel is open. If a single channeled canula is employed, the fluid returns, flows around the tip of the nozzle, and drips into the receptacle beneath. At this stage the fluid does not pass the compressor urethrae muscle. It merely flows as far as the bulb and returns.

“(f) About 1 pint of the solution is used in washing out the anterior urethra.

“(g) In the case of the single-channeled nozzle the reservoir is now raised by stages to 5 feet. With the two-way nozzle the exit channel is closed with the finger. The patient relaxes his compressor muscle by performing the voluntary movements of urination or simply diverting his attention elsewhere. The trick is learned after the first few sittings, and no local anæsthetic is ever required if solutions of the strengths and temperature indicated are employed. The solution then passes through the sphincter, permeates the posterior urethra, and enters the bladder.

"(h) When the bladder is full the clip is closed and the canula removed from the meatus. The patient then compresses his urethra near the glans and proceeds to urinate. The flow from the bladder balloons out the urethra until the pressure of the finger is removed. At first the solution is retained only a few seconds, but later on the patient will tolerate the ballooning of the penis for several minutes. It is by no means rare to find patients able to keep the penis ballooned out for 15 minutes without any discomfort whatever. When the bladder is emptied the process is repeated until the reservoir is empty, and each time the fluid is expressed from the bladder the penis is ballooned out with the passage of a few ounces of the solution at a time.

"The points to observe are:

"1. On no account use roughness or force. If at first the sphincter does not relax, do not try to force it. In a day or two the patient will learn the trick and no pain or discomfort need be caused.

"2. At first do not try to force too much solution into the bladder. Possibly he will allow only a few ounces to pass the compressor. This is quite sufficient. In a very short time he will be able to take half a pint without any trouble.

"3. Do not be tempted to use solutions stronger than those indicated. Much harm may be done by too vigorous treatment.

"4. Never attempt to force the sphincter by increasing the head of fluid. This can only lead to disastrous results. Five feet above the urethral level is the absolute maximum.

"5. Insist on the patient learning the trick of ballooning the penis during the exit of the solution from the bladder. Encourage him to persevere in attempting to hold it a little longer at each successive sitting. It may take him a week to tolerate one minute, but as time goes on this tolerance of longer periods will increase.

"6. Irrigation should be carried out twice daily."

The book contains an illuminating chapter on the use of vaccines in the routine treatment of acute and subacute gonorrhea as an adjunct to our local and general measures. Detoxicated vaccines of autogenous origin appear to be of value.

The latter half of the book is devoted to an able discussion of the complications of gonorrhea by direct extension and by metastases, the urethroscope and the urethroscope picture in health and in disease, chronic gonorrhea in the male, the standard of cure in the male, and the disease in women and children.

A notable feature of the book is the concise summary which concludes each chapter and an excellent bibliography of the subject treated in the chapter.

THE GOLD HEADED CANE, by *William Macmichael, M. D.* A NEW EDITION WITH AN INTRODUCTION AND ANNOTATIONS by *George C. Peachey*. Henry Kimpton, London, 1923.

It is nearly a hundred years since the first edition of *The Gold Headed Cane* came from the press of J. Murray, the noted London maker of books. William Macmichael, the author of this book, was born at Bridgenorth, in Shropshire, England, in 1784, and, after receiving his education at the grammar school of that town, entered as a student at Christ Church, Oxford, where, after receiving his degree of master of arts in 1807, he graduated as a doctor of medicine in 1816. In 1811 he was elected to the Radcliffe traveling fellowship which owed its foundation to the generosity of Dr. John Radcliffe, about whom he writes so delightfully in the book.

Macmichael began practice in London in 1818 and was elected a fellow of the College of Physicians of London in the same year. At the outset of his career he had the good fortune to secure the friendship of Sir Henry Hallford, one of the leading practitioners of his day, who was influential in securing his appointment to several important offices. In spite of powerful backing and the important positions he held, Dr. Macmichael lacked the ambition or did not possess the aptitude to acquire a large practice. He devoted his leisure to writing and to-day he is best remembered by two works, *The Gold Headed Cane* and *The Lives of British Physicians*. The latter was published in 1830 and passed through two editions. In 1837, at the age of 53, Dr. Macmichael suffered a stroke of paralysis which obliged him to retire from professional life. He died two years later.

Macmichael's friend, Sir Henry Hallford, was president of the College of Physicians of London from 1820 until his death in 1844.

Under Sir Henry's presidency the College of Physicians prospered. It acquired, largely through his individual efforts, a splendid new home on Pall Mall. The new college was opened on the 25th of June, 1825. As part of the opening ceremonies there was presented to the college a gold headed cane which had been the property of five eminent London physicians, Radcliffe, Mead, Askew, Pitcairn, and Baillie, and which to-day reposes in a glass case in the library of the college.

Doctor Macmichael conceived the idea of presenting the story of this cane in the form of an autobiography and to put into the mouth of the cane biographical details and recollections of the five great physicians through whose hands it had passed, accompanied by reflections upon medicine and medical matters of the time. The first edition was published in 1827, and a second edition in the succeeding year. A third edition, edited by Dr. William Munk, was pub-

lished in 1884, 45 years after Doctor Macmichael's death. In this edition the story of the cane was brought up to the year 1876. A fourth edition appeared in 1915 from the press of Mr. Paul B. Hoeber, of New York. It contained an introduction by Sir William Osler and a preface by Dr. Francis R. Packard.

The edition, which has recently been issued by Mr. Henry Kimp-ton, of London, follows the text and contains the illustrations found in the second edition, which was chosen for reprinting because it was revised, added to, and published by the author himself. The first edition contained 179 pages. To the second edition Doctor Macmichael added 88 pages of text which contain much of the best of his writing. The third edition, prepared by Doctor Munk, contained no illustrations and, although the continuation of the narrative is interesting, it is Munk's and not Macmichael's. In Mr. Kimp-ton's edition appear excellent photogravures of the five physicians. The introduction by Doctor Peachey is informative and to the American reader the annotations are highly illuminating.

THE FORM AND FUNCTIONS OF THE CENTRAL NERVOUS SYSTEM, by *Frederick Tilney, M. D., Ph. D., professor of neurology, Columbia University, and Henry Alsop Riley, A. M., M. D., associate in neurology, Columbia University.* Second edition. Paul B. Hoeber, New York, 1923.

To many of us the anatomy of the nervous system is reminiscent of student struggles with complicated parts of the body which seemed to have little practical value except to the neurologist. As our viewpoint broadens with the years we realize that every phenomenon of life is to some degree regulated by the nervous system, and there are few diseases which do not manifest defects in its controlling influences. This book, as the authors say in their opening paragraphs, is "designed to fill the gap between morphology and practical requirements of clinical medicine. It aims to visualize the living nervous system, to make accessible an appreciation of its vital relations to the functions which go to make up life, as well as the defects in these relations which result in disease." The book is the result of many years' experience in structural, functional, and clinical aspects of neurological teaching by the authors in Columbia University, and it is the first work of its kind which provides in a single volume a clinical and physiological interpretation of the brain and spinal cord adequate to the requirements of practical application. In it the anatomy and physiology of the central nervous system are not treated as independent branches of medical science, but are brought together as essential parts of the practical knowledge necessary to the proper diagnosis and treatment of disease.

The volume, which contains over a thousand pages, is amply illustrated by photographic reproductions of normal and pathological specimens, diagrams, and schematic drawings.

THE PATHOLOGICAL PHYSIOLOGY OF SURGICAL DISEASES, A BASIS FOR DIAGNOSIS AND TREATMENT OF SURGICAL AFFECTIONS, by *Prof. Dr. Franz Rost, University of Heidelberg*. Authorized translation by *Stanley P. Reimann, M. D., chief of pathological department of the Lankenau Hospital and assistant professor of experimental pathology, University of Pennsylvania*, with a foreword by *John B. Deaver, M. D., LL. D., Sc. D., F. A. C. S.* P. Blakiston's Son & Co., Philadelphia, Pa., 1923.

This is a work which should appeal to every surgeon, as it deals with questions which confront him in his daily work. It is a discussion of the physiological and pathological principles underlying surgical diseases and their relation to diagnosis, operative methods, and postoperative conditions. In its pages will be found explanations for many puzzling phenomena frequently met at the bedside. The book aims to present the physiologic effects of surgery as a guide to the proper surgical measures to be applied in a given case, inasmuch as it discusses nature's methods of compensation for and defense against the effects of man's interference.

As a guide to surgical diagnosis and surgical aftertreatment the book aims to outline general physiological facts which can be applied to specific cases and which enable the practitioner to treat his patients intelligently and in accordance with the findings of modern physiological research.

The author presents the pathological physiological data which have a bearing on the salivary glands, stomach, pancreas, liver and gall bladder, spleen, peritoneum, intestines, kidneys, bladder, male genitalia, hypophysis, thyroid gland, chest cavity, brain and spinal cord, and the extremities.

As there must be various viewpoints on any particular surgical problem the author has appended references to the literature of each subject which make available to the research worker in ready form the results of experimental and practical work in normal and pathological physiology that are scattered in journals, textbooks, and treatises, which few have either time or the opportunity to collect and digest.

It occurred to the translator of this work that some additions might be added regarding the subjects with which the staff of the institution with which he is connected have had extensive experience. These additions are plentiful and bring the work singularly up to date. The additions by the translator are bracketed.

The style of the book and the author's and the translator's method of presenting the subject may be judged by the following quotation, which is a portion of the discussion of the gall bladder.

"The *surgical procedure undertaken in gall-stone disease* consists either in removal of the gall bladder or in opening it and establishing drainage by means of a fistula. The latter is only a temporary affair, but if drainage of bile to the outside is allowed to continue for a considerable period of time, severe illness, especially digestive disturbances, results. Thus, with a complete bile fistula, there is the interference with fat absorption. Pawlow observed at autopsies of a number of animals with complete biliary, or intestinal fistula, a marked softening and pliability of the bones, which had led to fractures, especially of the ribs. Looser afterwards examined the bones histologically, and proved that the changes were actually osteoporosis. Schmorl observed the same condition with gall-bladder fistulæ in man. The osteoporosis in Schmorl's case was differentiated from simple senile bone atrophy by the predominance of the absorptive processes. Thus far, however, it is not known whether it is due to the absence of some important substance or to some entirely different cause.

"Since cholecystectomy is an operation which removes an organ at one stroke, it is necessary to inquire into the function of this organ in the body economy. Some physiologists think that it serves only to produce mucus (Schröder von der Kolk); others say it regulates the flow of bile (Luciani); still others maintain that the viscid gall-bladder bile mixes with the fluid liver bile and slows the current. While these writers lay more stress on the mechanical factors of bile flow, others see in the gall bladder a chemical-physiological function because of the increased usefulness of the thickened bile. Indeed, according to Hammarsten, the content of solids in gall-bladder bile is eight times greater than that of liver bile. It is thus clear from the beginning that bile from the gall bladder must contain substances for digestion in greater concentration than liver bile. The experimental removal of the organ has given only very general results, the workers being content to show that its removal was tolerated, which, of course, coincides with the fact that in man small, shriveled, non-functioning gall bladders are frequently found and no clinically demonstrable conditions traceable to its loss can be established. Although Rosenberg and Rost could not find any change in the total metabolism of fat and protein after experimental cholecystectomy, Rost, corroborated in the essentials by Klee and Kluppel, found that there is an alteration of bile flow, in that bile is constantly being discharged by drops into the intestine. But in some of the cholecystectomized animals a partial 'continence' appears after a few weeks; bile is not discharged constantly, but it flows periodically, just as before operation, and the bile stored in the bile ducts enters the duodenum in jets. The interval between two periods of bile flow is short, especially in the first few months, but these pauses gradually

lengthen, and finally a rhythmicity may be established which is almost as perfect as in the normal dog with gall bladder intact. This all depends on the functional capacity of the sphincter muscle, first described by Oddi, which closes the papilla. If it is strong and functions well, the bile is dammed back and collects in the large ducts; they then enlarge and form a substitute reservoir. But when the sphincter is poorly developed there is no dilatation of ducts, but a more or less constant flow of bile, i. e., there is a much poorer functional result. Rost could show on autopsy material that these same conditions result in man; he also observed that with a poorly functioning sphincter the danger of an ascending infection increases and no dilatation of the ducts takes place. We do not know why some of the previously normal animals become continent, while others do not. It should also be mentioned that not only do the bile ducts distend but the gall-bladder stump has a tendency to dilate into a new reservoir, especially when a portion of the cystic duct is left remaining.

"If continence is established in cholecystectomized animals, the flow of bile is as prompt as in normal animals, but of course the quantity expelled is considerably less, and what is probably more important, all the bile is discharged from the ducts at the first stimulus from the passage of the chyme in the duodenum, and none is left for the remainder of the food except as it is freshly secreted by the liver. Moreover, the bile in the ducts is only slightly concentrated and therefore must be poorer in active solids. Furthermore, Rost has shown that cholecystectomy influences pancreatic secretion, and only about one-third of the normal amount of bile plus pancreatic secretion is discharged to mix with a certain amount of food. This may possibly be due to exhaustion of the secretin, although why and in what manner secretion is influenced by the removal of the gall bladder is unknown. This inadequacy of pancreatic and bile secretion in its turn leads to a stasis of food in the duodenum which reflexly diminishes the hydrochloric acid production in the stomach. This is probably the best explanation for the resulting hydrochloric acid deficiency which now causes numerous general disturbances such as vomiting, eructations, gastric pressure sensations, constipation, etc. These symptoms are frequently attributed to adhesions, although in later laparotomies none can be found, but similar symptoms have been observed when an aseptic calculus occluded the gall bladder.

"[The rate at which the gall bladder can concentrate bile has been determined in the ingenious experiments of Rous and McMaster. They found that a gall bladder emptied at the beginning of an experiment and left to fill from the liver concentrated 49.8 centimeters to 4.6 centimeters in about 22 hours. The gall bladder has, of course,

often been considered a mere diverticulum in the duct system, but it is apparent that its functions are more than that. It, of course, contains smooth muscle within its walls and it is assumed that it squirts its contents into the duodenum when the sphincter of Oddi relaxes. The contrary innervation, as Meltzer termed it, is said to be such that the relaxation of sphincter and contraction of gall bladder take place synchronously. But the experiments of Doyon and others following have not demonstrated the existence of this mechanism. Indeed, attempts to record contractions of the intact gall bladder are beset with many difficulties and none have succeeded. The movements of respiration give records on tracing which obliterate any which the gall bladder may have made. By removing the organ and suspending it between levers in a bath of oxygenated Locke's solution as done with intestinal segments, etc., a slow contraction and relaxation indicative of ordinary smooth muscle tonus is obtained, but no active contractions. When the papilla of Vater is observed through a duodenostomy with the incision in the abdominal wall closed as far as possible to restore intra-abdominal pressure, it will be found that the bile runs out in a tiny stream as the sphincter relaxes and any spurts are absolutely synchronous with inspiration, i. e., when the diaphragm descends it presses the liver downward and squeezes out bile. In general, it may be concluded that an expulsive power has never been demonstrated in the gall bladder any greater than the secretory pressure of the liver (250 mm. water). When the sphincter is closed bile accumulates, and the pressure slowly rises; when the sphincter opens the bile runs out because of the pressure under which it was confined, plus the pressure against the liver and gall bladder from surrounding structures. Ether was necessarily used in these experiments, which were performed on dogs.]

"The results of cholecystenterostomy, by which operation the bile is led into the stomach, small intestine, or colon, have been studied experimentally by Viedemann, who paid particular attention to digestion as studied through fistulæ. He found that allowing the bile to flow into the stomach did not influence gastric acidity, at least not on a milk diet. Gastric motility is unchanged immediately after the operation, but later shows perceptible slowing. Intestinal digestion is not impaired by bile drainage into the stomach, but appears to be altered when the bile is drained into the small intestine.

"In animals a cholecystocolostomy exposes the bile passages to great danger of infection, but in spontaneous ruptures of the gall bladder into the colon, a subsequent cholangitis is not the rule.

"Experimental investigations of hepato-cholangio-enterostomy, i. e., anastomoses between branches of the hepatic duct and the gastrointestinal canal, were made by Enderlen and Zumstein. In

normal animals the anatomical structure is not especially favorable for this operation, since the larger ducts are deeply situated under the surface of the liver. But in chronic obstruction the branches are reached more easily.

"Intestinal contents have no injurious effect on living liver tissue, which offers an interesting additional fact to the problem of auto-digestion of living tissue, discussed above."

INFLAMMATION IN BONES AND JOINTS, by *Leonard W. Ely, M. D., associate professor of surgery, Stanford University.* J. B. Lippincott Co., Philadelphia, Pa., 1923.

Disease in bone derives its special interest from the fact that it runs its course locked up in a narrow case or shell, which influences its manifestations and treatment. Diseases of the small bones of the extremities and of the ends of the long bones are peculiar also in that they have in their immediate vicinity a closed cavity, the joint, whose involvement often overshadows the disease in the bone and gives the clinical picture its stamp.

Unlike many subjects in medicine, great difference of opinion exists as to the physiology and pathology of bones and joints. There is abundant clinical material available for study, but conclusions based on clinical opinion are notoriously conflicting. The gap in our knowledge of inflammation in bones and joints is due to our ignorance of bone pathology upon which this volume throws much light. The work is based upon the author's personal observation and research in the pathological laboratory and the correlation of his results with clinical findings in the clinics and hospitals of Stanford University.

In his researches the author has directed his attention especially to the various varieties of acute and chronic osteomyelitis, acute and chronic arthritis, tuberculosis of special joints, and arthritis caused by developmental abnormalities. His conclusions are original and practical.

Bone tissue itself seems not to be subject to inflammation, nor actively to disease, and simply reacts to disease or change in its contained marrow.

"In studying diseases in bone," says the author, "the changes in the bone tissue itself first attract our attention, but give us very little information. Whether we examine the bone with the naked eye, with the microscope, or with the Roentgen rays, we observe that the changes in it are of the simplest kind, and are only three in number—absorption or atrophy, production or hypertrophy, and death or necrosis. The further we investigate the stronger our conviction that all changes of bone tissue are purely passive, and are simply the result of changes in the contained marrow. The mar-

row * * * reacts quite promptly to infections. In laboratory animals dying of an infection I have often noticed a marked engorgement of the marrow; so often that I have come to regard it as a pathogenic sign of an infection."

The theory of the purely passive rôle of bone tissue itself is not by any means generally accepted, but the author points out many facts which have led him to believe that it is so. His observations, for instance, have led him to regard periostitis as an inflammation of the subjacent bone marrow—quite a departure from the standard teaching. He explains the frequency of the occurrence of infections of the bone marrow in the young by the fact that the marrow at this stage of life is essentially a lymphoid tissue. It is well known that if pus germs of sufficient virulence are carried in the blood stream to a lymph node, the lymph node suppurates and breaks down; if they are carried to the bone marrow, the bone marrow does the same. Trauma appears not to have the importance in this connection which is usually attached to it.

All through the volume the reader will find similar modifications of long accepted facts which have been brought about by the author's researches.

APPLIED PHARMACOLOGY by A. J. Clark, B A., M. D., F. R. C. P., professor of pharmacology in the University of London. P. Blakiston's Son & Co., Philadelphia, 1923.

The writer has endeavored in this book to give an account of the direct scientific evidence for the therapeutic action of the more important drugs which is available at the present time, and to demonstrate the importance of this knowledge in the clinical use of these drugs. The subject matter is arranged according to the therapeutic application of drugs, and so we find chapters on disinfectants, the action of mercury, arsenic, and antimony as internal disinfectants, the action of quinine in malaria, the action of emetine and the salicylates, the anthelmintics, alcohol, anæsthetics, depressants of the central nervous system, the pharmacology of the alimentary canal, the heart, circulation, respiration, kidneys, and uterus.

There are chapters on the pharmacology of temperature regulation and of the endocrine glands; chapters on the pharmacological action of radiations and of the products of protein breakdown; chapters on the vitamins and immunity reactions and on the physiological standardization of drugs. The drugs treated are those which have been studied by means of animal experimentation and as far as possible the author illustrates the action of these drugs by observations made upon patients; hence the physician who desires to practice scientific medicine will find much to assist him in his thera-

peutic endeavors in this book. The work is sufficiently up to date to mention Bayer "205" and the ethyl esters of chaulmoogra oil; but one looks in vain for a discussion of the action of the bismuth salts which are now being recommended in the treatment of syphilis. Mercurochrome "220" is not mentioned in the chapter devoted to the use of disinfectants for special purposes, and carbon tetrachloride, which has been found so effective in the treatment of ankylostomiasis, is not included in the discussion of the anthelmintics. The author's failure to consider these therapeutic factors is not a fault; it merely illustrates the rapid growth of that branch of medical science with which he deals.

A REFERENCE HANDBOOK OF THE MEDICAL SCIENCES EMBRACING THE ENTIRE RANGE OF SCIENTIFIC AND PRACTICAL MEDICINE AND ALLIED SCIENCE, by various writers. Fourth edition. Edited by *Thomas Lathrop Stedman, A. M., M. D.* Complete in eight volumes. William Wood & Co., New York, 1923.

The Reference Handbook of the Medical Sciences has served two generations of medical men. It was first published in 1884 under the supervision of a medical editor of note, Dr. Albert H. Buck. The publication of the third edition was completed in 1917. The World War, however, brought about so many changes in medical and surgical practice that the publishers felt that an extensive revision of some of the articles and the addition of many new ones were urgently called for. It is pleasing to note that the new articles which appear in the fourth edition treat not only of subjects coming to notice for the first time during the war but also of new knowledge acquired in the natural course of medical progress since the appearance of the third edition.

The list of contributors contains the names of men who stand at the head of their respective specialties, hence the information contained in the various articles is singularly authoritative and up to date.

STATE BOARD QUESTIONS AND ANSWERS, by *R. Max Goepf, M. D., professor of clinical medicine at the Philadelphia Polyclinic; assistant professor of clinical medicine, Jefferson Medical College.* Fifth edition. W. B. Saunders Co., Philadelphia, Pa., 1923.

The purpose of this book is to provide a convenient compend for the use of those who wish to prepare themselves for State board examinations. In compiling the volume the author has adopted a convenient order in the arrangement of the questions, and a few simple and obvious questions have been interpolated here and there in order to maintain the continuity of the subject.

In the preparation of this edition the author has included only such new material as has been generally accepted and is no longer in the

controversial stage. One finds that the most essential developments of the last few years and those which may be expected to furnish new questions in the course of the next year or two have been included. The subjects of physics, chemistry, anatomy, physiology, pathology, bacteriology, materia medica and therapeutics, medicine, surgery, obstetrics, gynecology, and hygiene are covered.

DENTAL SURGERY, by *Wesley Barritt, O. B. E., L. D. S. (Eng.), and Alfred T. Barritt, L. D. S. (Eng.)*. Henry Kimpton, 263 High Holborn, W. C. 1, London, 1922.

This is a small volume on dental surgery arranged in the question-and-answer form, prepared by the authors apparently not with the idea of assisting the dental student to pass examinations but with the view of supplying him with a handy outline of the essentials of the subject.

SPECTACLES AND EYEGLASSES, by *R. J. Phillips, M. D., ophthalmologist, Presbyterian Orphanage*. Fifth edition. P. Blakiston's Son & Co., Philadelphia, 1923.

This book gives a clear and concise description of the method of measuring, fitting, and adjusting spectacles and eyeglasses. In the first part a general description is given of the principles of placing lens before the eye and the name of the parts of eyeglasses and spectacles with the part that are adjustable emphasized. The methods of checking the lens after the prescription has been filled is last described. The proper centering of the lenses, measuring for prisms, spheres, and cylinders is clearly shown. The book would make a good addition to the library of the naval ophthalmologist.

DIGEST OF DECISIONS.

Suicide among the personnel of the Navy and Marine Corps is not infrequent, yet the conditions attending suicide are varied and the question of line of duty and misconduct must be determined upon the facts set forth in the records or the events. Injustice may easily be done in the case of men who commit suicide under similar circumstances and even by similar means. One man's act is declared in line of duty, as, it appears, some one has said or the man himself has displayed evidence that he was "peculiar," perhaps mentally deranged. Another man, however, has exhibited no such evidence, and therefore his act is adjudged misconduct and not in line of duty; nevertheless, he may have been just as deranged as the former.

In order that there might be fairness to all and a consistent policy established to govern such cases, the Secretary of the Navy requested that the question of suicide and its probable background be briefly outlined. The following memorandum has therefore been furnished:

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 17, 1923.

MEMORANDUM FOR THE SECRETARY OF THE NAVY.

Subject: Suicide.

1. For the purposes of the Navy, suicides may be divided into two groups:
The adult deviates.
The insane.

2. Conscious reasons for suicidal acts have no finality. However, many conscious formulations have in them vague distortions and projections from the unconscious which make them worthy of notation if not for dependence in suicide motive. The position taken by some authorities is that only by fathoming the unconscious can we get at the true motivatism to the suicidal act. There is no standard for mental soundness.

3. Many of the bravest and most reckless deeds have had a suicide component in that premeditated self-destruction is accomplished by placing oneself in a position of extreme danger and leaving the rest to chance, the real intent being concealed by what appears to be extraordinary bravery or by the sentiment that it is sweet to die for one's country—"Dulce et decorum est pro patria mori."

4. In antiquity the church came to frown upon suicide and placed drastic penalties, thus changing public sentiment and opinion, and for this reason even in our day religion is strongly inhibitive of suicidal thought and act in those

communities or countries genuinely pious and devoted to dogmas of the church, and also in those isolated individuals who have suicidal tendencies but whose religious scruples are of sufficient reactive force to restrain from the act. Religion both checks and punishes. Where there is a laxity of community and religious sentiment (as in cities) suicide increases as the inhibiting influence of society is removed and the forces of present-day civilization are more pressing in their reaction upon the human nervous system. Here, too, enters the influence of suggestion and example not only as to the deed but also as to the means as set forth in the daily newspaper.

5. That suicide is essentially pathological seems true, although there are adherents to the belief that the existence of nonpathological suicide has never been proved. Such a view must involve the belief that a man of sound mind has the instinct of self-preservation so strongly that self-destruction is impossible. Before suicide can be committed there must be a severe mental conflict due to the cross pull of the instinct of self-preservation and the desire for extinction.

6. That suicide is one of the outcomes of insanity has always been recognized, and since insanity is shown to be on the increase the number of potential suicides must also increase in proportion. Stearns analyzed 167 self-inflicted deaths, during a period of five months, of which 65 persons were frankly insane, 8 were psychoneurotic, 6 were psychopathic (abnormal personality), and 9 were alcohol or drug addicts. In other words, 88, or somewhat more than half, were presumably mentally unsound, 25 were victims of physical disease, 15 were considered as delinquents, and 9 were senile.

7. To say that the suicide is a neurotic, a constitutional inferior, is not proper. A motive must be sought in the relations of the present day. According to Stelgner, the common factor is a contraction of mental capabilities and inability by means of the will, reason, or imagination to escape from an untenable position. Werther said, "Nature finds no way out of the labyrinth of confused and conflicting thoughts, and the man must die." There is an overvaluation of circumstances, conditions, events, or deeds, a fear of fear, a balancing of desire by an equally strong fear of the objective. The early environment seems to be strongly influential in individuals with an hereditary predisposition.

8. It is evident that suicide must be studied in groups only. It is held that suicide in the insane psychoneurotic criminal, drug addict, invalid, etc., can throw no light on suicide in those who apparently are sound and have everything to live for. Furthermore, from the Navy standpoint, the poorly adjusted period of adolescence is that period of the young man's life during which he enlists or enters the service and is a time when he is exceptionally susceptible to impressions and emotions. Daily occurrences, circumstances, deeds of accomplishment or failure, etc., set up constantly new motives to renounce life which soon become so numerous and pressing as to be adequate to unbalance the controlling factors. It is not known what may be behind a so-called philosophical suicide.

9. It has long been known that no neurotic ever feels suicidal unless he has first wished the death of others and that in such a case his impulse to murder is turned back upon himself. One must say there are probably good instances of sane self-destruction but not normal self-destruction, i. e., if one believes that the fundamental normal desire is for an enduring continuity of the life process. Apparently the sane suicides have the same psychology as the psychotics though the full and conscious motivation to the act may not be analyzed so specifically, veiled perhaps by the milder states of mental alteration and deviation from the normal.

10. What, therefore, are the determining factors in the suicidal act? As stated by L. Pierce Clarke, New York Medical Journal of September 16, 1922, they are as follows:

"(1) There must be a great disturbance of the normal balance of desire to live. This may or may not formulate itself as a distinct psychosis.

"(2) There is in this regression or withdrawal from a normal adaptation to reality an increase of intrapsychic tension—this tension, formed from the conscious and unconscious conflicts usually resolves itself into what is properly called a sin, either of commission or omission.

"(3) If the infantile unconscious demand is sufficiently strong and the mental regression goes deep enough we obtain the fundamental solution in self-destruction not because in the last analysis the person really chooses this end consciously but because the dynamic fixation of infantile attachment decides it. This is usually formulated directly as the call of the parent or loved one, or by the still more insistent demand of a Supreme Being."

11. While disease or condition, physical or mental, may be, perhaps usually is, the final determining factor in suicide, the underlying substrata of inherited tendencies is however most important. The type of person who has a fundamentally self-abusive temperament is much more likely under stress of adverse environment or disease to wish himself out of the world.

12. A state of mind induced by disease, adverse circumstances, depressing environment, self-accusation, fear, a sense of inefficiency, failure, etc., especially superimposed on any inherited tendencies or an impulsive temperament, would seem strongly essential to precipitating the suicidal thought and act. Hence an abnormal state of mind and a disturbed judgment or reasoning control of the impulses predisposes to and is a forerunner of the act.

13. While it has never been proven conclusively, because our present methods of examination are probably faulty, that normal persons do or do not commit suicide, nevertheless there is strongly suggestive evidence upon which is based the opinion that no person commits suicide without there being a background of conflict, perhaps arising suddenly, which may be concealed so well by the individual as to be neither apparent nor elicited by examination. The person lacks the power of control of will or of judgment as to the propriety of his contemplated act, and an overwhelming impulse to dispose of every requirement or responsibility with which he may be confronted is precipitated by a surge of emotion the compelling urge of which is such as to force the no longer controllable hand.

14. It is the opinion of this bureau, therefore, that all persons who commit suicide or attempts at suicide may well be adjudged insane, or, if not actually so, to be psychopathic individuals with an unstable emotional balance to be classified within that zone interposed between the sane and the frankly insane. This opinion is substantiated by the following statement by Dr. William A. White, of St. Elizabeths Hospital:

"It is my opinion that a bona fide attempt at suicide should be considered as evidence of mental disease. I am so convinced of this that I feel that the proof should rest with the individual who claims the contrary. My recollection of the statistics in Munich at the Psychiatric Institute bear upon this point directly. In Munich it was the regulation to take all people who attempted suicide directly to the Psychiatric Institute rather than to the prisons, and a result of the examination of these people showed 80 per cent of them to be "insane." And this was many years ago before the personality make-up was understood as well as it is now. The other 20 per cent would not undoubtedly

be found to be suffering from serious intrapsychic difficulties. There are perhaps a very few suicides that might be classed as sane, in such instances, for example, where the individual deliberately chooses what he conceives to be the lesser of two evils. However, I feel, from having had experience with very many cases, that these are indeed rare."

E. R. STITT,
Surgeon General United States Navy.

The following letter of the Judge Advocate General relative to the discharge and reenlistment of enlisted men suffering from insanity who had to their credit more than 12 but less than 16 years' naval service on July 1, 1922, is of interest to all medical officers.

26254-3591 : 8 J.

DEPARTMENT OF THE NAVY,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, D. C., 30 March, 1923.

From: The Judge Advocate General.

To: The Chief of the Bureau of Medicine and Surgery.

Subject: Enlisted men suffering from insanity who had to their credit more than 12 but less than 16 years' naval service on July 1, 1922; discharge and reenlistment thereof.

Reference: Your letter February 10, 1923, RA-LJT PR&R-185691.

1. Inclosures in reference returned.
2. The following propositions are submitted in reference for consideration and opinion of this office:

(a) If an enlisted man with more than 12 but less than 16 years' service to his credit on July 1, 1922, is suffering from a mental disability requiring institutional care and is a mental incompetent on the date of the expiration of his current enlistment, can his current enlistment be continued for the purpose of completing 16 years' service prior to transfer to the Fleet Naval Reserve?

(b) If an enlisted man with more than 12 but less than 16 years' service to his credit on July 1, 1922, is suffering from a mental disability not requiring institutional care, nor would he be a menace to himself or the community if discharged, but still remaining a mental incompetent on the date of the expiration of his enlistment, shall he be discharged from the naval service; and if so discharged, can he then execute a legal contract of reenlistment in the naval service for the purpose of completing 16 years' service prior to transfer to the Fleet Naval Reserve?

(c) If an enlisted man with more than 12 and less than 16 years' naval service to his credit on July 1, 1922, now mentally incompetent, recovers to such an extent that on the date of the expiration of his current enlistment he be adjudged mentally competent and reenlists, but prior to and at the time of completion of 16 years' service he again be adjudged mentally incompetent, what procedure may be taken to transfer him to the Fleet Naval Reserve?

3. The act of July 1, 1922 (42 Stat. 800), provides relative to this subject as follows:

"That enlisted men who have served for more than 12 but less than 16 years shall be permitted to reenlist and continue serving, unless sooner discharged by sentence of a court-martial, until they have completed 16 years' service, whereupon they shall, upon their own application, be permitted to transfer to the Fleet Naval Reserve."

4. The question of whether or not enlisted men of the Navy who had more than 12 but less than 16 years' naval service to their credit on July 1, 1922, may be discharged from the naval service on account of disability, having been presented to this office for consideration and opinion, it was held August 29, 1922, file No. 26254-3591:3, that enlisted men "who have served more than 12 years, but less than 16 years, can not be discharged from the service except by sentence of a court-martial until they have been permitted to round out 16 years' service, but that they must be reenlisted and permitted to continue serving, regardless of physical and other qualifications, except misconduct such as would warrant their discharge from the service by sentence of a court-martial."

5. It was further held in said opinion that enlisted men who had served more than 12 years in the Navy on July 1, 1922, are especially favored, and that they shall be retained in the service regardless of the reduction required by other provisions of said act. "In other words, it is apparent from an examination of the provisions of said act that Congress intended that enlisted men who had to their credit more than 12 years' service on July 1, 1922, should be permitted either to transfer immediately to the Fleet Naval Reserve under certain conditions or to reenlist in the service and to continue serving until they are in a position to transfer to the Fleet Naval Reserve after 16 years' service." The only condition under which such enlisted men may be discharged from the service is by the sentence of a court-martial for conduct warranting such sentence. It follows, therefore, that Congress having provided that said enlisted man shall have the benefits of reenlistment and transfer to the Fleet Naval Reserve, it is necessary for the department to so administer said provisions as to conserve for said enlisted man the benefits of reenlistment and transfer to the Fleet Naval Reserve after 16 years' service. *Beley v. Naphataly*, 169 U. S. 359; *Ross v. Doe*, 1 Pet. 667; *Jones v. Guaranty, etc., Co.*, 101 U. S. 626; *In re Matthews*, 109 Fed. 619.)

6. In view of the foregoing this office is of the opinion that in the case of an enlisted man with more than 12 and less than 16 years' naval service to his credit on July 1, 1922, who is mentally incompetent to make the necessary written agreement for the extension of his enlistment required by the act of August 22, 1912 (37 Stat. 331), or to make a contract of reenlistment, the department may continue him in his present status until 16 years' naval service have been completed, whereupon the department may transfer him to the Fleet Naval Reserve without requiring him to file the necessary application therefor, and questions (a) and (b) are answers accordingly.

7. In the event that such individual has recovered to an extent that he is mentally competent on the date of the expiration of his current enlistment to reenlist and accordingly reenlists, but is mentally incompetent at the time of completing 16 years' service to request his transfer to the Fleet Naval Reserve, this office is of the opinion that the department may transfer him to the Fleet Naval Reserve without requiring his application for said transfer, and question (c) is answered accordingly.

8. It is noted from the inclosures that the brother of E. S. V., C.M.M., United States Navy, requests that said enlisted man be transferred to some institution in the East, preferably the Pennsylvania State Hospital for the Insane, at Norristown, Pa., in order that said enlisted man may be closer to his family. To accomplish the transfer of this man to an institution for the insane other than St. Elizabeth's Hospital, Washington, D. C., would necessitate his discharge from the Navy into the custody of his family or his transfer to the care of the United States Veterans' Bureau.

9. In view of the present condition of said enlisted man, this office is of the opinion that any request from him for his discharge from the service, either for the purpose of entering an institution near his home, at his own expense, or as a beneficiary of the Veterans' Bureau, should not be given serious consideration, and that the department may in fact discharge this man from the custody of the Navy Department only upon the request of a duly appointed conservator, guardian, or committee, and not otherwise.

J. L. LATIMER.

Approved 30 March, 1923.

T. ROOSEVELT,
Acting Secretary of the Navy.

In connection with the question of the elimination of the unfit, inapt, or undesirable enlisted personnel from the Navy, the following correspondence is of interest:

APRIL 3, 1923.

From: The Chief of the Bureau of Medicine and Surgery.

To: The Chief of the Bureau of Navigation.

Subject: The elimination of the unfit, inapt, undesirable, enlisted personnel.

1. The bureau desires to invite attention to the present practice of discharging recently enlisted men by medical survey under such diagnosis as constitutional inferiority (mental), flat feet, epilepsy, incontinence of urine, and the like.

2. In most cases the alleged condition may or may not be proved to exist from a legal standpoint, yet in all probability it existed prior to enlistment but was not apparent nor discovered, nor reported (flat feet) in the routine examination at the recruiting station, and, for this reason, frequent discussion is set up as the origin and line of duty status, and statements in rebuttal are made, necessitating reference to the Judge Advocate General.

3. Furthermore, these cases after a few days' service gravitate to the sick bay and hospital, with subjective symptoms rather than objective, and develop thereby a considerable medical record which does not necessarily set forth any disease, condition, or disability. Ultimately they appear before a board of medical survey and are subsequently discharged for physical disability, almost invariably given "in the line of duty," and are placed in a position to make claim for pension should occasion arise, and yet the Government is in no way responsible nor are these men entitled to pensions.

4. In the case of those men where it is necessary to refer the question of origin of disability to the Office of the Judge Advocate General, that office is considerably embarrassed in arriving at the obvious opinion, for the reason that data is either inadequate or unobtainable to substantiate the findings of the board of medical survey or to support well-established medical opinion, and the Judge Advocate General is therefore obliged to render decisions in accordance with law, although the circumstances are obviously contrary to such finding. It has been repeatedly held that unless very conclusive evidence or facts can be presented to show that the disease, or condition, or disability, existed at some time prior to enlistment that "line of duty" must be given to these cases, in view of the fact that the law holds that a man accepted for the service without a record being made of any defect must be considered physically sound. The Judge Advocate General has further held the opinion that from a legal point of view every individual is presumed to be of sound mind

and to have average mentality until it has been conclusively shown otherwise; that in cases diagnosed as "constitutional inferiority (mental)" a board of medical survey is frequently not supported by the facts adduced before it and is of the opinion in such cases that the individual is suffering from intellectual sluggishness or from emotional excesses which render him inapt for the naval service or subject to disciplinary action.

5. The bureau would, therefore, recommend that the practice be adopted of disposing by discharge as undesirable or inapt all enlisted personnel found within three months for any reason (physical or mental, other than frank incapacitating disease or condition) as unsuited, unqualified, undesirable, or inapt for the naval service, and to reserve discharge by medical survey to those men who have actually incurred disability from service or who have a disease or condition of an incapacitating character and clearly demonstrable upon physical examination (such as chronic valvular heart disease).

6. It is further recommended to accomplish the foregoing practice that the following procedure be adopted;

That obviously inapt or undesirable men will be discharged from the training station without being sent to the hospital.

That only those cases where there is present a debatable condition, yet who are considered by the officers at the training stations as unsuited or undesirable for the Navy, be transferred to the hospital as with diagnosis "No disease" for a period of observation and returned to the training station to duty without medical survey being held. The commanding officer of the hospital will submit recommendation as to the disposition to be made by the commanding officer of the training station. In this way only the hospital ticket and necessary entries in the health record will be made to accomplish the purpose intended. Should surveys be held, they should be held for record only and to establish the existence of "No disease" or incapacity and should set forth the question of inaptitude or undesirability. Should it appear, however, that an individual may be benefited by proper treatment, he should be rendered sufficient treatment to restore him to duty to remain in the service.

7. While this procedure or practice will increase the statistics for inaptitude or undesirable discharges, it decreases the statistics of medical survey disability discharges, but, more important, will in a measure protect the Government from being obliged to assume responsibility where no responsibility rests.

8. In support of the foregoing procedure, however, it is considered highly desirable that all personnel on recruiting duty should be strongly urged to use greater care in the examination of recruits and to strive for quality and careful selection.

E. R. STITT.

[First indorsement.]

57364-281.

BUREAU OF NAVIGATION, 20 April, 1923.

From: The Chief of the Bureau of Navigation.

To: The Secretary of the Navy (Judge Advocate General).

Subject: The elimination of the unfit, inapt, undesirable enlisted personnel.

1. Forwarded for comment.

2. This bureau is in accord with the opinion of the Bureau of Medicine and Surgery that steps should be taken to safeguard the Government against claims by men discharged as a result of medical survey for disability which existed prior to enlistment and contemplates directing the transfer of men whose

physical condition is such as to interfere with the proper performance of their duty to hospitals for observation. If in the opinion of the medical officer at the hospital these men are unsuited for the naval service, they will be returned to their stations with notation in their health record, but without medical survey. The commanding officer will then be authorized to discharge such men with an undesirable or inaptitude discharge.

THOS. WASHINGTON.

[Second indorsement.]

29372-161.

128586(41)

DEPARTMENT OF THE NAVY,
Washington, 27 April, 1923.

From: The Secretary of the Navy.

To: The Chief of the Bureau of Navigation.

Via: The Chief of the Bureau of Medicine and Surgery.

Subject: The elimination of the unfit, inapt, undesirable, enlisted personnel.

1. Returned.
2. The department approves the recommendations of the Bureau of Medicine and Surgery and Bureau of Navigation as follows:
 - (a) That the commanding officers of training stations be authorized to discharge for "inaptitude" or as "undesirable" recruits obviously inapt or undesirable.
 - (b) That where there is a question as to the inaptitude or undesirability of recruits for service in the Navy they be transferred to the hospital with diagnosis "No disease" for a period of observation.
 - (c) That after observation and determination of the physical condition in each case those recruits who may be found to be inapt or undesirable but not suffering from any disease be returned to the training station for discharge.
 - (d) That those recruits who are found after observation to be suffering from some disease be treated in the same manner as other patients.

EDWIN DENBY.

The following correspondence has resulted in a change in article 1196, United States Navy Regulations, which will require that when an entry "not in the line of duty" is made in a patient's health record or other medical record and the patient does not desire to submit a statement in rebuttal, he shall sign a statement to that effect in the record:

WEE:EGP: R&PD-127551(51).

APRIL 28, 1923.

To: The Judge Advocate General.

Subject: Article 1196, Navy Regulations.

1. The following change is recommended either as an amendment of article 1196, Navy Regulations, or as paragraphs of instruction in the Manual of the Medical Department.
2. Article 1196 of the regulations requires that when the medical officer enters on the health record that any disability was not received in the line of duty or was the result of misconduct it shall be the duty of the medical officer to inform the patient, in which event the patient has the right to file a statement in rebuttal.

3. The medical officer makes the record of the entire transaction; and if no rebuttal is made by the patient, the entry to this effect also is recorded solely by the medical officer. This record being of an official character is supposedly final but the credibility of the record is placed upon the medical officer alone.

4. It is, however, possible and instances are already on file in which the patient has averred facts in denial of this record long after the events and at a time when the several parties concerned are distantly separated or out of the service. The statement of the patient has been sustained, the authentic records made at the time of disability notwithstanding. Nevertheless the record as made stands on the books and it has been held by the Judge Advocate General that "In the event that the facts in a particular case show that the entry in question is erroneous, said entry may not be stricken from the record, but an additional entry should be made showing wherein and to what extent the original entry is in error. An entry in a public record whether correct or erroneous thereby becomes a fact which may not be destroyed, but if in error such additional entry or entries may be made, and in fact should be made, as are necessary to show the nature of the error sought to be corrected." Whatever may arise to induce the patient to become interested in changing the record may not be known to the department nor does it seem reasonable that such statements should receive such extraordinary consideration in defiance of the records.

5. The bureau considers that the present practice of dealing with this matter is conducive to fraud and to distortion of facts and records. It is therefore recommended that each patient, in whose health record entries of not in line of duty and/or of misconduct are made, be required to sign a statement something like the following in his medical record:

"In accordance with article 1196, United States Navy Regulations, 1920, you [name] are informed that you are admitted to the sick list with [diagnosis], the origin of which is considered not in the line of duty and (is) or (is not) the result of your own misconduct.

(Medical officer.)

"I acknowledge having been informed that the origin of the diseases or condition [diagnosis] with which I am suffering is not in the line of duty and (is) or (is not) the result of my own misconduct and I have { nothing
a statement } to offer in rebuttal."

6. It is therefore recommended that the regulations be amended to carry such requirements as to the above statements as are necessary and legal.

E. R. STITT.

[First indorsement.]

DEPARTMENT OF THE NAVY,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, 7 May, 1923.

From: The Judge Advocate General.

To: The Chief of the Bureau of Medicine and Surgery.

Subject: Navy Regulations, proposed change in article 1196 relative to entry "not in the line of duty" in medical record.

1. Returned.

2. This office believes that the change in article 1196 of the Navy Regulations which you propose to recommend, for the purpose of putting the patient on record at the time as to whether or not he desires to make any statement in rebuttal to an entry of "not line of duty" in his medical record, is desirable.

3. Numerous cases have come to the attention of this office where the individual affected has subsequently contended that he had not been informed at the time relative to the entry of "not in line of duty." In some instances this situation has rendered it impossible to get at the facts existing at the time the entry was made. It is believed that any injustice arising from this situation would be cured by requiring the patient to make a statement at the time the entry is made or as soon thereafter as his physical or mental condition permits.

4. The following wording of the acknowledgment to be signed by the patient is submitted in lieu of the wording contained in your recommendation:

"Having been duly informed of the finding that my present disability [diagnosis] was not incurred in the line of duty and is *not* the result of my own misconduct I *do not* desire to submit a statement in rebuttal."

J. L. LATIMER.

THE DIVISION OF PREVENTIVE MEDICINE.

Lieut. Commander J. R. PHILIPS, Medical Corps, United States Navy, in charge.

Notes on Preventive Medicine for Medical Officers, United States Navy.

INSTRUCTIONS TO MEDICAL OFFICERS.

FOOD POISONING ON THE U. S. S. "IDAHO."

While at anchor off Panama, March 25, 1923, a rather serious outbreak of food poisoning developed. From 10.30 a. m. to 1 p. m. 90 cases of sufficient severity to require bed treatment were admitted. Two hundred and five cases with less severe symptoms occurred.

The outbreak occurred on Monday, liberty having been granted the two days previous. Investigation showed that approximately half of those affected had remained on board over the week end. The outbreak occurred so suddenly and such a large number of men were attacked that an accurate record was not made. No doubt quite a number of men with symptoms of poisoning failed to report at sick quarters. The first cases appeared about 10.30 a. m. and within two hours about 100 cases developed.

The first symptom complained of was pain in the abdomen, followed by nausea, with severe and persistent vomiting. In some instances the vomitus contained blood. Following this there was marked prostration, feeble pulse, severe muscular cramps, and headache. Later diarrhea occurred. Only in a few cases was there a rise in temperature.

On account of the large number of cases no attempt was made to care for any except the most severe in the sick bay. The forward section of the forecastle was roped off, hammocks were spread on the deck, and the waterways were used to receive the vomited material. Hospital corpsmen were placed on watch, and rounds were made by the medical officers at frequent intervals.

Treatment consisted in washing out the stomach with water containing sodium bicarbonate. This being accomplished by having all cases drink copious quantities of sodium bicarbonate solution immediately on reporting. The nausea was so severe and persistent

that no other medication was attempted until later in the day, when a castor-oil cocktail containing two drams camphorated tincture of opium was given each case. Twenty-five patients with severe vomiting, marked prostration, and cramps, were cared for in the sick bay and were treated symptomatically. Anodynes were given, heat was applied, and the muscles of the legs were massaged. By 7 o'clock in the evening of the same day vomiting had stopped, and all cases showed marked improvement. At sick call the following morning, only six cases showed any symptoms or serious enough effects from the attack to be retained on the sick list.

Investigation as to the cause of the outbreak took into consideration what food had been served during the preceding 24 hours. In view of the fact that approximately 50 per cent of those affected had been on liberty the day before and had taken no meals on board, the food served at breakfast on the morning of March 26 was considered responsible. Breakfast consisted of boiled rice, milk, and sugar, fried-meat hash, hot biscuits, bread, butter, and coffee. An accurate check was made and all patients stated that they had eaten breakfast and had eaten hash. No cases occurred in the wardroom, junior officers', warrant officers', and chief petty officers' messes. On account of the fact that no cases developed during the night of March 25 and also that 50 per cent of those affected had not eaten supper on board March 24, the food served at supper was not considered at fault. It consisted of cold meats, head cheese, cold beans, potato salad, coconut layer cake, bread, jam, and coco.

The meat used in preparing the hash was beef received from the U. S. S. *Arctic* on March 8 and was inspected and found frozen and in excellent condition when received on board. It was placed in cold storage, and when broken out on March 24 steak was served to the general mess for dinner. All other messes also obtained meat from the quarters of the beef referred to above, which was cooked and eaten on March 25. No symptoms developed in any member of these messes. The trimmings from the steak served on Sunday, together with two other quarters of beef, was cooked after dinner on the same day. After cooling it was ground up and placed in galvanized tubs.

On the morning of March 25 potatoes (cooked that morning), ground onions, and condiments were added to the meat and the whole put in pans and baked. The other articles served at breakfast could not be considered responsible, as they were the same as regularly served each meal and of a standard make and quality.

A sample of the hash was submitted to the Ancon Hospital for examination, but the only report received was to the effect that the sample was in a state of decomposition. It was not examined until March 27, 48 hours later, and had not been kept in a refrigerator.

After careful consideration of all possible causes the conclusion reached was that the poisoning was due to the meat used in making the hash.

Editor's comment.—In connection with this outbreak of food poisoning reported from the U. S. S. *Idaho* it is of interest to recall a similar outbreak that occurred on board the U. S. S. *North Dakota* Saturday morning, October 29, 1921, as she was entering the harbor of Newport, R. I., after three days at sea en route from the southern drill grounds. Breakfast was served at 6.30 a. m., and the first man affected appeared at the sick bay just about two hours later, cases developing in ever-increasing numbers until about 10 a. m. Most all of those attacked had their initial symptoms before 11 a. m. More than 200 cases were treated during the day, and of these 148 patients were sufficiently ill to require bed treatment and observation for 12 hours or longer. There were no deaths. Probably as many more men were affected, but did not consider themselves sick enough to report at the sick bay. The symptoms included persistent vomiting, prostration, rapid pulse, headache, muscular and intestinal cramps, and diarrhea, which began in most of the cases from two to six hours after the initial symptoms.

More or less confusion resulted with a large number of men lying on the deck on blankets, hammocks, etc., in the compartments adjacent to medical department spaces, groaning and vomiting and overtaxing all facilities for coping with diarrhea, while new victims were appearing every minute. All patients were encouraged to drink freely of a warm solution of sodium bicarbonate, and when vomiting became less continuous an ounce of castor oil was given to each man who could be induced to take it. Whisky was given in cases where there was pronounced prostration and sweet spirits of niter or an anodyne when intestinal colic or cramps in skeletal muscles demanded.

As in the case of the outbreak on board the U. S. S. *Idaho*, poisoning was attributed to beef hash served for breakfast the morning the cases occurred. Five quarters of beef, solidly frozen and seemingly in good condition, of good appearance and without odor indicative of spoiling, were broken out of cold storage at 10 a. m., October 28. This meat had been frozen for the Navy and delivered in New York under Government inspection about three weeks before the poisoning occurred. After thawing out, meat from four of the five quarters was served and eaten the same day. Twenty pounds was used by the wardroom mess for dinner without affecting any member; 28 pounds in the form of rib roast was consumed by the junior officers with no indication of poisoning. Beef stew made from parts of all four of the quarters mentioned was served

as the main dish for the crew's supper that afternoon. The remainder of the meat from these quarters together with meat from the fifth quarter, previously unused, was prepared to be made into hash for the crew's breakfast the following morning. This meat was cut into pieces 4 or 5 pounds each and put on to boil at about 2 p. m. After cooking, it was transferred to roasting pans, and at 9 p. m. it was ground up and again placed in roasting pans until about 5 a. m. the following morning, when freshly cooked potatoes, raw onions and freshly opened canned tomatoes were added and cooked together to form hash. The chief petty officers also had beef hash for breakfast and no case of poisoning developed among the 48 members of the mess who partook of it, but the meat which went into that hash, three or four pieces, weighing in all about 15 pounds, was drawn at the galley by the chief petty officers' messman and was ground up by him, and these few pieces might well have come only from one or more of the four quarters extensively used by officers' messes as well as the general mess the preceding day.

It seemed improbable that any meat served on October 28, or prior to that date, had any connection with the outbreak, because no officer was affected to the slightest degree; no case developed until after breakfast on the 29th and the cases then appeared closely grouped with regard to elapsed time and intensity of symptoms. Nevertheless, the menu for the entire week was studied without finding anything likely to have been responsible.

Breakfast on the morning of the 29th consisted of fresh beef hash (potatoes, tomatoes, beef, and onions), canned milk, prunes, hominy grits, bread, butter, and coffee. The foodstuffs eaten by 84 of the men with the more severe symptoms were compared with the articles of food eaten by 76 men of the crew who did not develop any symptoms. A summary of this data shows that of the 84 men who had marked symptoms, all ate hash, 59 ate prunes, 7 ate hominy, 74 drank coffee, 22 used milk, and 83 ate bread and butter. Of the 76 men who did not develop symptoms, 66 ate hash; many of them only a little, 57 ate prunes, 6 ate hominy, 66 drank coffee, 2 used milk, and 75 ate bread and butter. This evidence would strongly suggest the hash as the cause of the outbreak.

The outbreak on board the U. S. S. *North Dakota* was considered by a board of investigation as most probably caused by beef contaminated or infected with the *Bacillus enteritidis* or some member of the group in which that organism belongs, and it also appeared probable that the fifth quarter of beef which was used in making the hash for the crew's breakfast but from which no meat was served on the previous day was solely responsible for the poisoning. As is frequently the case, there was no meat and no hash available

for culturing a few hours later when symptoms of poisoning developed, all garbage and leavings having been disposed of in cleaning up after the morning meal.

According to modern views in the public health world such instances of poisoning are believed to be caused by bacterial contamination of the meat, sometimes by pollution with intestinal contents while cutting up the body immediately after slaughter, or by a general infection of the animal before death. In cases of meat poisoning where the offending microorganism has been found it has generally proved to be the *B. enteritidis* itself (Gärtner bacillus). The *Bacillus cholerae suis*, otherwise known as *B. suispestifer*, has also been determined as the cause of numerous outbreaks of meat poisoning. Rosenau states that these bacilli belong to a group of organisms which has the typhoid bacillus at one end and the colon bacillus at the other, the intermediate forms including the paratyphoid bacilli, *Bacillus psittacosis*, *B. icteroides*, *B. typhimurium*, *B. enteritidis*, *B. paracolon*, and others.

The toxins of the *B. enteritidis* and *B. cholerae suis* resist the degree of heat which ordinarily penetrates to the interior of pieces of meat in cooking. According to Park if the bacilli have had an opportunity to multiply freely and produce large amounts of toxin the meat will cause disease even though the bacilli be killed during cooking. However, even though there be no preformed toxin, cooking can not be relied upon as a means of rendering infected meat safe for consumption, unless it be thorough, as bacilli might survive in the center of the meat. The toxins are preserved in frozen meat. Cold meats used for salads or meats that have been kept for other purposes particularly are likely to cause poisoning if contaminated. Study of various outbreaks has shown that many persons who partook of the meat along with those who became ill had no symptoms of poisoning.

When meat containing the living bacilli is eaten infection may follow. In such cases there is a definite period of incubation of from 2 or more days when acute gastroenteritis is the prominent feature, up to from 8 to 18 days in the typhoidlike type of case, depending upon the microorganism responsible, the mass dosage, and other immunological factors.

One would expect an incubation period of at least 24 hours before the appearance of symptoms when caused by a true toxin with no living microorganisms present, but experience with outbreaks where these bacilli have been found in the meat has shown that symptoms have sometimes appeared within two hours after eating the contaminated cooked food. Park gives the following as a characteristic example:

"An apparently healthy calf was slaughtered. Two days later a baker made 160 meat pies. Over 50 persons were made sick, and 4 of these died. These 4 ate pies which had been kept 10 days or more. The outbreak was due to the *Bacillus enteritidis*, which was believed to have greatly multiplied during the two days' storage at a moderately warm temperature. All the cases presented similar symptoms. The chief of these were vomiting, diarrheas, and shivering. In some cases collapse occurred. Pains in the abdomen and back were felt by many. The symptoms began in from 5 to 14 hours after eating."

As a rule meat contaminated or infected with *B. enteritidis* or *B. cholerae suis* does not show any suggestive change in appearance, texture, or odor. The spoiling of meat and fish with putrefactive changes, so likely to occur in hot weather, is caused by other bacteria. A word might be added with regard to chemical changes that sometimes take place when boiled meats in quantity and comparatively large pieces are kept overnight packed in tubs or boiling pots. The crew of the U. S. S. *Wyoming* lost their turkey meat from an otherwise perfectly good Thanksgiving dinner in 1921 in that way. The turkeys were received the day before in good condition. The galley force was shorthanded and the birds were cleaned and boiled at once, and were then packed one upon another in large containers, where they stood overnight in the presence of water, water vapor, and air. The following day while being roasted some of the turkeys developed odors and flavors suggestive of putrefaction, unpleasantly fecal-like in character. The fear excited among the crew caused them to refuse pieces that had no bad taste or odor and practically it became necessary to reject all of the meat.

HEALTH OF THE NAVY.

Sickness rates declined progressively during the month of June, as was to be expected with the advent of summer weather. The admission rate for all diseases was 492 per 1,000 per annum. This figure is about the average for the past three years at this season. The rate for May was 675 per 1,000. The reduction in the general morbidity rate is due principally to a progressive decline in the prevalence of respiratory diseases. Admission rates for bronchitis, tonsillitis, and influenza have dropped steadily in recent weeks. There have also been comparatively few admissions for other communicable diseases.

The accident rate since the first of the year has averaged 65 per 1,000 per annum, as against 58 for the corresponding period last year and 50 in 1921. This rate is higher than it should be and indi-

cates the necessity for publicity and watchfulness, because many of the injuries are caused by carelessness and are thus preventable.

The following table shows annual rates per 1,000 per annum for the principal communicable diseases, entire Navy, for the month of June, 1923. For comparison, corresponding median rates for the same month, 1918 to 1922, inclusive, are given:

	Median rate for June, 1918- 1922, in- clusive.	June, 1923.
Cerebrospinal fever.....	0.07	0
Diphtheria.....	.89	.21
German measles.....	.46	0
Influenza.....	21.98	14.12
Malaria.....	14.31	6.16
Measles.....	11.49	9.87
Mumps.....	19.27	14.12
Pneumonia.....	2.90	3.25
Scarlet fever.....	.46	.53
Smallpox.....	.15	.11
Tuberculosis.....	3.26	2.23
Typhoid fever.....	.10	0

One case of smallpox was reported from the U. S. S. *Pittsburgh* at Toulon, France, for the week ended June 9. Twenty-one cases of measles occurred at the naval training station, Hampton Roads, Va., and 18 at the naval training station, San Francisco, Calif. Single or unrelated cases of diphtheria, mumps, and scarlet fever occurred at several of the shore stations. Mumps was somewhat more prevalent than usual among the forces afloat, 30 cases being reported by three ships in the Scouting Fleet and 39 cases by eight ships in the Battle Fleet.

LENGTH OF EXPOSURE NECESSARY TO STERILIZE MESS GEAR WHEN DIPPED IN BOILING WATER.

The question, how much time is required to sterilize dishes by the application of hot water at various temperatures, has recently come up for consideration in connection with an investigation of the suitability and efficiency of dishwashing machines of the spray type operated under service conditions.

It was surprising to find that very little definite information on this point could be found in the literature. Most writers make only general statements to the effect that boiling kills practically all non-spore-bearing bacteria at once, or that wet heat at a temperature of 140° F. will destroy them in 20 minutes. Those concerned with the pasteurization of milk have made many studies, using temperatures

between 145° and 155° F., but the question of temperatures that can be maintained in dishwashing machines and the necessary times of exposure seem to have escaped investigation, although Hahniman in his work on milk quotes Bang as having determined that the tubercle bacillus is killed by a temperature of 85° C. (185° F.) in 30 seconds. It became necessary, therefore, to perform a series of experiments under conditions similar or analogous to conditions encountered in the operation of dishwashing machines. These experiments were carried out in the bacteriological laboratory of the United States Naval Medical School under the supervision of Lieut. J. E. Houghton, Medical Corps, United States Navy. Active cultures of staphylococcus aureus and B. coli were mixed with whole beaten eggs. Broken pieces of crockery were then heavily contaminated with the egg mixture, which was allowed to dry on.

Each piece when thoroughly dry was seized with a pair of sterile forceps and rinsed for 30 seconds in a 5 per cent solution of sodium carbonate held at a temperature of 130° F. This was done to simulate the washing of dishes in a spray or jet type machine where an alkaline mixture is used for cleansing before rinsing and the final stage in which boiling water is expected to sterilize. The dried egg mixture was not removed from any of the pieces in 30 seconds. That is well, because while mess gear is expected to emerge from any dishwashing machine clean to the eye, certain pieces such as cups and bowls which are cracked or contain fissures in which food may be lodged are sometimes overlooked in routine scullery work.

After the washing stage the pieces of contaminated crockery were immediately dipped in water held at a temperature of 200° F. for various periods of time, 15, 30, 45, 60, 90, and 120 seconds, after which they were transferred to large culture tubes containing 0.4 glucose agar with Brom thymol blue indicator. All cultures where the exposure in water at 200° F. was less than one minute showed growth of both the staphylococcus and colon bacillus. All tubes where the exposure was one minute or longer showed no growth of the test microorganisms after incubation periods of 24, 48, and 72 hours. The bactericidal effect of exposure for 60 seconds was then checked by ten separate experiments.

Water at a temperature of 200° F. instead of actively boiling water was chosen in order to provide a factor of safety inasmuch as machines of the spray or jet type, although designed to deliver boiling water in the final or sterilizing stage, may not at all times actually do that. With the tank or dip type machine the water can be kept boiling actively at all times. Nevertheless, the scullery crew on board ship will frequently cut down the steam delivery in order to prevent the hot water from splashing over if they are not watched.

They can handle the racks of mess gear faster too if the water is not bubbling.

From these experiments it may be concluded that dipping mess gear for 60 seconds in water that is actually boiling will destroy all common pathogenic microorganisms, provided the dishes have been cleansed sufficiently by hand so that no visible food material remains adherent.

It is important to reduce the time in boiling water to as short an exposure as can be allowed with reasonable safety. Even with an exposure of only one minute, accurately measured with a watch, the time required for sterilizing and putting away the racks after each meal mounts up on board a big ship. Unless the time is accurately measured with a watch for every rack the exposure will not be anything like what the scullery man thinks it is. The average man thinks the rack has been immersed for a full minute at the end of 30 or 40 seconds.

The spray or jet type of dishwashing machine has several advantages but it presents certain difficulties. It would certainly be a fine thing to have equipment that would permit the washing of all mess gear in the scullery as well as sterilization. With dip tanks this can seldom be done; dishes, knives, forks, and spoons must be washed by the messmen at the mess tables after each meal, the soapy water being drawn from the scullery. This causes delay, results in the slopping about of water, and prolongs the messy period in the various living compartments after each meal. But the method is safe from a public health standpoint under adequate inspection by the medical department because the visibly boiling water in the tank reaches all parts of the immersed mess gear.

With the spray type of machine it is doubtful if the streams of water in the final stage can always be maintained at 200° F. or above, and one can not be sure that the hot water is directed upon all parts of all articles in the rack or into all cracks and fissures. If not, it is a matter of doubt as to how long an exposure is required for all parts of the contained mess gear to reach a sterilizing temperature before the holding period begins. Certainly a total exposure of 60 seconds can not be regarded as safe and it would be only guesswork to say that two minutes is sufficient.

**DISCIPLINARY ACTION WHEN GONORRHEA IS ACQUIRED WITHOUT
RECORD OF PROPHYLAXIS.**

General Order No. 69, now in force, does not demand disciplinary action for failure to report exposure to possible venereal-disease infection, as did paragraph 6 of General Order No. 29. This omis-

sion does not prevent commanding officers from requiring that exposures shall be reported and disinfection applied as deemed necessary after return from liberty, whether or not prophylaxis has been self-administered.

The Judge Advocate General of the Navy discussed this question in Court-Martial Order No. 9, of September 30, 1922, as follows:

It is the opinion of the department that General Order 69, in superseding General Order 29, was intended to repeal the disciplinary features of the latter and to be merely explanatory in character and to set forth matters of instruction, advice, and warning on the subject of exposure to venereal diseases.

Accordingly it would seem that, in view of the advisory, rather than mandatory, character of General Order 69, disciplinary action can not properly be based upon the failure to comply with the terms thereof. However, attention is invited to the fact that concealment of an infectious or communicable disease which endangers the health of others may be made the subject of trial by court-martial on the ground that such concealment under the conditions prevailing in a military service is an offense in itself and can be recognized as such even in the absence of express prohibition.

The Bureau of Medicine and Surgery began to provide tubes for the self-administration of prophylaxis with a view to encouraging more general and more prompt use of prophylaxis. The bureau did not consider it advisable or necessary by departmental order to make prophylaxis mandatory after return to ship or station when the individual claims to have administered prophylaxis himself. Besides, it was desirable to obtain a statistical measure of the general value of self-administered prophylaxis.

If the medical officer, with a knowledge of local conditions, believes a reduction in admission rates for venereal diseases can be secured by requiring reports of exposure and the administration of prophylaxis under medical department supervision, as was required by General Order No. 29, in addition to the free issue of prophylactic tubes, it is his duty to recommend to his commanding officer that report of exposure be required and that men who fail to report and later become infected be punished for concealing exposure to a communicable disease dangerous to the public health.

Sometimes, of course, conviction can not be secured for the lack of definite evidence as to when the particular exposure occurred from which infection resulted. Nevertheless, if the men know that it is a duty to report exposure and that failure to report and subject themselves to disinfection irrespective of the earlier application of self-administered prophylaxis renders them liable to punishment, and if they occasionally learn of punishments awarded, the efforts of prevention will be at least more successful than otherwise.

In many instances, especially on board ship, where liberty is not a daily occurrence, there is no difficulty about proving that the man failed to have the infecting exposure recorded.

The difficulty that may arise at a shore station is illustrated by quotations from recent correspondence between the commanding officer of marines at a foreign station, the Judge Advocate General of the Navy, and the Bureau of Medicine and Surgery. This related to the case of a marine tried by summary court-martial for failure to take prophylactic treatment in violation of a post special order. The Judge Advocate General of the Navy discussed the case in the following letter and requested comment regarding the maximum period of incubation:

1. In reviewing the record of proceedings of the summary court-martial held January 4, 1923, in the case of the above-named man, it is noted that he was convicted on the following specification, to which he pleaded "not guilty":

"In that -----, attached to and serving with the -----, having, at some unknown time between December 1, 1922, and December 12, 1922, exposed himself to venereal infection, did, immediately following such exposure, fail to take the prophylactic treatment as prescribed by Post Special Order No. 30, dated November 19, 1922."

2. The prosecution established the fact that ----- was on liberty in the city of ----- every day from December 1, 1922, to December 10, 1922, both dates inclusive, with the single exception of December 8, 1922. It further established the fact that -----, on December 12, was admitted to the sick list with an acute case of gonorrhea, and that the last date, previous to his admission on which he reported for venereal prophylaxis was December 1. The medical officer, qualifying as an expert, gave his opinion that the period of incubation of a gonococcus infection is from a few hours to eight or nine days, the average period being about three days; that the infection which the accused had on December 12, could not have been the result of his intercourse on December 1, especially in view of the fact that he took prophylaxis within 15 minutes after exposure; that, in this connection, it is the consensus of opinion by medical officers who have made a study of this question that venereal prophylaxis is effective in practically 100 per cent of cases, if administered within the first hour after exposure; that it takes about 45 hours to develop an acute case of gonorrhea.

3. The accused was duly sworn as a witness in his own behalf and testified that the last time previous to December 12 that he had intercourse was on December 1, and that within 15 minutes after exposure he had taken prophylaxis.

4. The record of proceedings in this case was forwarded to the Chief of the Bureau of Medicine and Surgery for an expression of opinion as to whether medical science on the point at issue is sufficiently exact to warrant a conclusion of fact, within the limitations of the doctrine of reasonable doubt, to the effect that the venereal disease contracted by the accused under the circumstances of this case must have been contracted by exposure subsequent to December 1, 1922.

5. The Chief of the Bureau of Medicine and Surgery commented upon this point as follows:

"It is the opinion of the bureau that the limitations of the doctrine of reasonable doubt, to the effect that a venereal disease contracted by the accused under the circumstances of this case, are sufficiently strong to outweigh the evidence that the infection was contracted subsequent to December 1, 1922. It is very possible that the infection was derived by the exposure of

December 1, 1922, and that infection was modified by the efficacy of the prophylactic measures which were attempted on that date. While the testimony of the medical officer is that based upon experience, it can not be stated specifically that the infection was not attended by incubation period of unusual duration.

"It is the opinion of the bureau, therefore, that ——— should be awarded the benefit of the doubt."

6. In view of the foregoing the Acting Secretary of the Navy directs that the finding and sentence in the foregoing case of ——— be set aside and that you cause his records to be corrected accordingly.

Whereupon the commanding officer of the marine barracks wrote as follows:

1. In view of the opinion of the Chief of the Bureau of Medicine and Surgery, as given in paragraph 5 of reference (a), information is requested as to the opinion of that bureau of the probable incubation period of the disease of gonorrhea, in order that the undersigned may be guided in the future when cases of this nature come up before him for investigation.

2. A liberal interpretation of the opinion rendered by the Bureau of Medicine and Surgery mentioned above leads the undersigned to believe that disciplinary action by trial by court-martial for the violation of regulations regarding the administration of venereal prophylaxis is practically eliminated, since it is impossible to prove the commission of such an offense unless the accused pleads guilty to the specifications.

3. It is noted that the Bureau of Medicine and Surgery apparently doubts that the period of incubation may take as long as 11 days. In view of the opinion rendered in the case of ———, it is believed that the ends of justice will be advanced if the office of the Judge Advocate General will inform the service at large that men should not be tried for the offense mentioned in this letter unless there is evidence that the period of incubation must have been within the limits prescribed by the Bureau of Medicine and Surgery.

The above was forwarded by the Judge Advocate General to the Bureau of Medicine and Surgery for comment and recommendation, and the bureau's reply was as follows:

1. The incubation period of gonorrhea, like the incubation period of many other infectious diseases, varies from the average by many days in a small percentage of the cases. It is not possible to make any hard and fast statement regarding the maximum period of gonorrhea in the male in the case of a first attack, and in the case of a subsequent attack not only may the period of incubation vary widely but contention is also likely to arise with regard to recurring activity of a previous infection, and sometimes an alleged previous infection which did not exist. The evidence upon which an opinion as to what may constitute the longest possible interval between exposure and appearance of the earliest signs in gonorrhea is notoriously unreliable, because judgment depends upon the willingness of all individuals concerned to tell the truth as well as upon the accuracy of their observations and memory of exposure in each instance.

In a great majority of all new infections the incubation period is between 3 and 10 days; 20 per cent of primary infections and 55 per cent of secondary infections appear before the fifth day. Some observers of wide experience state the average period as from 7 to 10 days and the minimum and maximum

as 24 hours and 14 days, respectively. However, there are a few cases recorded in the literature wherein the urethral discharge is stated not to have appeared until the twenty-first day. This may or may not have been true.

2. General Order No. 69, superseding General Order No. 29, leaves the question of disciplinary action in cases where venereal disease has been acquired without reporting exposure and without subjection to the measures of disinfection known as prophylaxis entirely to the discretion of the commanding officer.

3. All questions arising in connection therewith can very well be handled locally, and the bureau believes this is very generally being done throughout the service. Of course, where liberty is being granted every day, cases will not infrequently arise where men who are sufficiently well informed may through false statements guard themselves behind improbable but possible limits of the incubation period. Nevertheless, forcing the crew to realize that concealment of known exposure to a communicable disease is dangerous to the public health, and failure to submit to such measures as may still prevent infection constitutes a violation of existing orders in the command, and is punishable as the commanding officer may see fit, is a valuable preventative measure that should not be omitted because of occasional or, under special circumstances, frequent failure to secure conviction.

4. The commander in chief of the Asiatic Fleet has recently found it expedient to restore within his command, in virtue of his authority, all the provisions of General Order No. 29 which were omitted from General Order No. 69.

In this connection experience in the United States Asiatic Fleet during the past year is interesting. The fleet surgeon in his annual report discusses the question as follows:

The statistical data for the years of 1921 and 1922 follow:

	1921	1922
Average complement.....	6,305	7,644
Admissions.....	4,306	6,371
Rate per 1,000.....	714	833.46
Total sick days.....	51,057	66,812
Deaths.....	47	38
Rate per 1,000.....	6.487	4.9712
Percentage of admissions due to venereal disease.....	46.01	44.26

The percentage of venereal diseases to total admissions is slightly decreased from 1921, but the annual rate per 1,000 is higher. The figures for the last four years follow:

Year.	Per cent of total admissions to venereal disease.	Rate per 1,000.
1919.....	26.49	187.87
1920.....	37.88	295.25
1921.....	46.01	314.19
1922.....	44.06	368.92

In analyzing the figures from the different ships and stations the percentage of venereal disease ranges between 20 and 89 per cent of the total admissions. It is believed that this figure can be materially reduced, and the matter will be made the subject of a conference when the fleet assembles at Chefoo, China, in May. It is apparent that the issue of individual prophylactic tubes has not produced the desired results, and it is believed that it will be necessary to supplement this method by the additional application of the old method requiring prophylaxis to be taken upon return to the ship. Almost without exception the men claim that they have used the prophylactic tube as they had been taught, within a period of three hours after exposure, and yet the percentage of venereal disease to the total admissions remains practically the same. No check can be made on their statements, and the only logical deduction to be drawn is that their statements are not to be relied upon. The principle of prophylaxis is proven beyond a doubt, and if it can be applied under a leak-proof check system it produces results. It is proposed to try the following procedure in an effort to reduce the present percentage:

1. The continuance of issues of individual tubes as heretofore.
2. The administration of prophylaxis on return of liberty parties to ships with the institution of a careful check system to see that no men escape who have been exposed.
3. The institution of the necessary disciplinary measures in cases of proven falsehood.
4. A revival of careful monthly inspections of crews for venereal disease which has been allowed to fall into disuse.
5. The placing of ships and stations on a competitive basis just the same as for gunnery and engineering.

The first method would prove effective with the men who stay sober and really regard their personal health; the second method should prove effective with the men who do not use their prophylactic tubes ashore—mostly those under the influence of liquor, or those who are careless; the third and fourth methods should discourage falsehood, and the fifth will instill a competitive spirit among the commanding officers and the medical officers of the different ships, a low percentage being a matter of commendation, and a high percentage one for reproach. It is appreciated that the application of the double prophylaxis system may somewhat weaken the value of the individual tube, but there will be assurance that all exposures receive prophylaxis, and there is no such assurance now. The conditions under which ships operate on the Asiatic Station are largely similar. The wide divergence in figures, it is believed, can be accounted for by the zeal or lack of zeal of the medical officers concerned. Ships and stations will report their percentages of venereal disease and other data monthly. A bulletin will be issued from the flagship showing their relative standings each month.

Recreational activities have been encouraged to the utmost extent possible. With the exception of the ration, it is the biggest single factor in determining the contentment of the enlisted personnel. Everything possible will be done during the current year to extend these activities. In connection with this subject the recommendations of some of the medical officers and of the commander Yangtze Patrol Force, regarding the establishment of additional club-houses for enlisted men on the Upper Yangtze River will be studied, and a supplementary report submitted at a later date. The same subject will be studied at Chefoo, China, and information and recommendations will be included in the above-mentioned report.

NOTE ON THE PREVENTION OF MALARIA IN THE NAVY.

Monthly sanitary reports from shore stations which have malaria problems indicate that the usual summer activities to prevent and limit the breeding of anopheline mosquitoes are going forward as well as available funds for this work permit.

The post surgeon, marine barracks, Quantico, Va., states that in addition to antimosquito work all cases of malaria are given continuous treatment with quinine for three months after discharge to duty in order to reduce recurrences to a minimum and to prevent as far as possible the infection of new mosquitoes. Men whose health records show previous malaria infection are examined once each month for parasites. Malaria patients and suspects are carefully screened, of course.

This paragraph serves as a reminder that too often the treatment of malaria is not followed for a sufficient length of time by observation and treatment after symptoms and clinical signs have disappeared.

A record should be kept of men who have had malaria, either by keeping their health records apart from the main file, by cards, or even in a book, so that like men who have syphilis and require blood tests and treatment from time to time they will not be forgotten. The records of the bureau show that 3,523 cases of malaria were admitted to the sick list in 1921 and 2,249 cases were readmitted. In 1922 there were 1,969 admissions and 1,576 readmissions. Many of the readmissions resulted from transfer to hospital or transport. Up to the present time all readmissions have been punched on the statistical cards in the bureau without differentiation. From now on a record will be kept of the reasons for readmission, and recurrences will be sorted out. Likewise, every Form F card that shows an original admission for malaria will be scrutinized and checked against previous cards showing admission for this disease, in an effort to ascertain whether the case is a recurrence due to inadequate treatment.

AN INSTRUCTIVE CASE OF CEREBROSPINAL FEVER.

The following case occurred at the naval training station, Newport, R. I., in the person of an apprentice seaman:

He reported ill at 3 p. m., May 24. At that time he complained only of mild symptoms and there was no indication of serious disease. At 8 p. m. he vomited material of coffee-ground character. Vomiting was followed by severe prostration. There was no indication of meningeal involvement at that time. Because of prostration he was transferred to hospital immediately.

He had a good night but the following morning his condition was serious and a profuse hemorrhagic rash had appeared. He was thought to be suffering with purpura hemorrhagica. Later in the forenoon rigidity of the neck muscles occurred and spinal puncture about 20 hours after the first symptom resulted in a diagnosis of meningitis shortly before his death.

No other case occurred. Contacts were segregated and kept under close medical supervision for 10 days. All contacts were cultured, but no carrier was found.

IMPROVEMENT IN THE QUALITY OF RECRUITS NOTED AT THE NAVAL TRAINING STATION, NEWPORT, R. I.

During May, 1923, the average complement of the station was about 1,300. The decreased activities of recruiting stations is reflected here in the lowered number of recruits under training. The evidence of greater care in the selection of men by the recruiting stations is apparent in the recruits as they come to this station and are placed under supervision of the training and medical organization. The morale of the men under training is excellent. Drill periods and class instructions are followed by recreation periods for baseball and other athletic sports. The majority of recruits under training show an appreciable gain in physical development. Increase in weight occurred in 78 per cent of the drafts transferred during the month. There was loss of weight in 22 per cent of the men transferred. In the greater number of men showing loss of weight, the cause, after investigation, is found to be the physiological reduction of fat incident to physical exercise and a properly balanced ration.

EXCESSIVE NUMBERS OF DENTAL DEFECTS AMONG RECRUITS REQUIRING TREATMENT AT NAVAL TRAINING STATIONS.

The medical officers of the naval training stations at San Francisco, Newport, R. I., and Hampton Roads, Va., comment in their last monthly sanitary reports upon the amount of dental work which must be performed during the training period.

The medical officer at the Newport station reports that the duties incumbent upon the dental surgeons are extremely heavy and that these officers are unable to accomplish all the work at hand. Because of ever-changing personnel they can not hope to catch up with the work. This is obviously an unsatisfactory state of affairs. In spite of constant application and exclusive attention to their duties, 74 per cent of the men about to be transferred from the station had caries of the teeth.

The senior medical officer at the Hampton Roads station reports that more than 1 per cent of all recruits arriving on the station dur-

ing the month of May were physically unfit for the naval service according to paragraph 1475 of the Manual of the Medical Department, 1922, and it seems to him that recruiting officers in the field either pay very little attention to the oral condition of applicants or else they do not understand the provisions of that article. He concludes that a tremendous amount of dental work is thrown upon the dental officers, not only at the training station, but throughout the service at large because of the wretched condition of the teeth of men accepted at recruiting stations.

NOTES FROM THE NAVAL TRAINING STATION, HAMPTON ROADS, VA.

The health of the command has been very good indeed during the month. One case, diagnosed here as chickenpox and transferred to the naval hospital, was stated by the commanding officer of that institution to be smallpox. This man was a marine, and all precautions were promptly employed to prevent spread of the disease. The results of the vaccination of the entire marine personnel were quite surprising in that of 142 men comprising the guard 32 developed a very positive reaction. All the rest of the guard showed reactions of immunity.

One case of cerebrospinal fever appeared in unit "E." The patient was sent to hospital with the diagnosis undetermined, but it was the opinion there, even before making a lumbar puncture, that the case was one of meningitis. Cultures were made from the respiratory passages of all men who lived in the same bungalow and no carrier was found. In every case of communicable disease the clothing and bedding of the men who have been even remotely in contact with the patient are sterilized by steam under pressure, and living quarters are thoroughly disinfected by washing with an antiseptic solution.

INSTRUCTIONS TO MEDICAL OFFICERS.

WSD/MG 124942-O.

Circular letter.
Serial No. 275-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 30, 1923.

To: All naval hospitals, continental limits and Pearl Harbor; naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.; naval medical school, Washington, D. C.; post surgeon, marine barracks, Quantico, Va.; senior medical officer, naval training station, Hampton Roads, Va.

Subject: Revised schedule of wages for civil employees under the Naval Establishment, effective July 1, 1923.

Reference: M. & S. circular letter, Serial No. 273-1923, #124942-O, June 27, 1923.

1. The schedule of wages which becomes effective July 1, 1923, contains certain changes which were not anticipated and which necessitates amplification of the instructions contained in reference.

2. In making the readjustment directed by paragraph 3 of reference, the present 1924 allotments for civil establishment, both for "Administration—Clerical" and "Maintenance and Operation—Labor," will be considered together as one sum, and the redistribution by subheads will include (f) clerical, as well as (a) transportation; (b) power house; (c) commissary; (d) laundry; (e) buildings and grounds; and (g) technical. For example, if present allotments are for

Maintenance and operation.....	\$100, 000
Administration.....	25, 000

the total amount to be redistributed under the several subheads will be \$125,000.

3. The only exception to this readjustment of civilian force to keep within allotments will be in the case of the "Reconstruction aide group," for which new request for allotment may be submitted based upon present number of employees; this item does not affect the bureau's appropriation.

4. It is suggested that most careful consideration be given to the practicability of discharging or furloughing certain parts of the force according to seasons; to accomplish this, the present plan of uniform quarterly allotments may be abandoned, and each quarter estimated to meet its needs, the total of the four quarters being held to the total of the present allotment. However, a definite amount must be estimated for each quarter, as:

First quarter.....	\$30, 000
Second quarter.....	35, 000
Third quarter.....	35, 000
Fourth quarter.....	25, 000
	<hr/>
	125, 000

5. Consideration also will be given to the complete closing down of hospital laundry plants, discharging all employees; the saving from the pay of laundry employees to be distributed among the other hospital activities. The hospital laundry would then be sent, if practicable, to some other Government laundry in the vicinity, or, if such arrangement can not be made, handled by contract. The bureau will consider such action, if recommended.

6. It is noted that the schedule makes no change in the method of computing the pay of chief mechanics, head mechanics, etc. Any difficulties arising in connection with the pay of these supervisory mechanical employees will be submitted to the bureau by separate letter.

F. L. PLEADWELL, *Acting.*

WEE: SS 126039(54).

Circular letter.

Serial No. 274-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 28, 1923.

To: All naval hospitals.

Subject: Examination of Red Cross personnel assigned to naval hospitals caring for tuberculous patients.

1. The following communication has been received from the Assistant Director of War Service, National Headquarters, American Red Cross, and from the Bureau of Naval Affairs, American Red Cross:

"I have been requested to advise you that the American Red Cross will be glad to have instructions issued to commanding officers of naval hospitals caring for tuberculous patients to the effect that Red Cross personnel assigned to these hospitals should be given a physical examination by medical officers at the time of their entrance on duty to the naval hospital concerned, and at such periods as may seem advisable."

2. The bureau desires that the request of the American Red Cross be complied with in so far as it is possible to do so.

F. L. PLEADWELL, *Acting.*

WSD/MG 124942-O.

Circular letter.

Serial No. 273-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 27, 1923.

To: All naval hospitals, continental limits and Pearl Harbor; naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.; Naval Medical School, Washington, D. C.; post surgeon, marine barracks, Quantico, Va.; senior medical officer, naval training station, Hampton Roads, Va.

Subject: Revised schedule of wages for civil employees under the Naval Establishment.

Reference: M. & S. circular letter, serial No. 255-1923, #124942-O, April 24, 1923.

1. The bureau is informed that the revision of the present schedule of wages will be released on June 30, 1923, and that the new rates of pay will become effective as of July 1, 1923.

2. The nature and extent of the changes carried in the new schedule are not yet known, but whatever the increases may be over present rates, no additional funds can be allowed over the total estimated cost under present allotments for civil establishment, 1924. This measure is absolutely required because of the reduced appropriation for the fiscal year 1924 and the large increases in pay already in effect.

3. Immediately upon receipt of the new schedule, therefore, the activities addressed by this letter will make such readjustments in the civilian complement as may be required to keep within the total of the amount already allotted for 1924 and will submit report thereon showing revised distribution under the several subheads, as follows:

Example.

Estimated cost, \$.....

Quarterly allotment, \$.....

	Pay per month.	Total.
(a) Transportation:		
3 chauffeurs.....	\$106.08	\$3,818.88
1 machinist.....	153.08	1,847.04
	.....	5,665.92
(b) Power house:		
1 engineman.....	160.16	1,921.92
4 firemen.....	122.72	5,890.56
	.....	7,812.48

Example—Continued.

	Pay per month.	Total.
(c) Commissary:		
1 chief cook.....	\$110. 00	\$1, 320. 00
Etc.....		
Etc.....		
(d) Laundry:		
1 chief launderer.....	130. 00	1, 560. 00
Etc.....		
Etc.....		
(e) Buildings and grounds:		
1 chief mechanic.....	228. 80	2, 745. 60
Etc.....		
Etc.....		
(f) Technical:		
Etc.....		
Etc.....		

4. It will be clearly understood that the readjustment above directed contemplates the discharge of a sufficient number of employees to keep within allotments. In this connection attention is invited to the fact that no discretion is allowed in paying the rates of the schedule, and that employees of Groups I, II, and III who have been receiving the maximum pay of the schedule of May 1, 1923, must be paid the maximum of the schedule to become effective July 1, 1923.

F. L. PLEADWELL, *Acting.*

Circular letter.
Serial No. 272-1923.

WSD/MG 124677-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 22, 1923.

To: All naval hospitals; post surgeon, marine barracks, Quantico, Va.; naval submarine base, San Pedro, Calif.

Subject: Care of the dead; cremation.

Reference: M. & S. circular letter Serial No. 248-1923, #124677-O, March 3, 1923.

1. The annual contracts for care of the dead for the fiscal year 1924, prepared in accordance with reference, provide for the embalming, preparation, incasement, and transportation or burial of the dead of the Navy and Marine Corps. No provision is made in these contracts for cremation.

2. The bureau for a number of years has favored cremation as a means of disposition of the dead, but has been unable to adopt it as a general practice

on account of opposition from the people from whom the enlisted force is largely drawn, and on account of certain religious objections to cremation.

3. When requested by the next of kin, however, and on prior authority of the bureau, cremation will be permitted at Government expense, provided such expense is not in excess of the amount which would be required to prepare and incase the body in the usual manner under existing contract, plus such additional amount as would be incurred by the Navy for interment or transportation home. In other words, the bureau is willing to meet the desires of the next of kin for cremation, provided the expenses are not in excess of those which otherwise would have been incurred.

4. The expenses of cremation, when authorized as above, will be covered by separate special requisition in each case.

F. L. PLEADWELL, *Acting.*

Circular letter.

WWB/d F-1-42022.

Serial No. 271-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, June 22, 1923.

To: All medical officers, chief pharmacists, and pharmacists.

Subject: Forms N. M. S. H. C. 1 and 5, revised.

Reference: Par. 355(1) (j), Manual of the Medical Department, as changed by M. & S. letter 128014(41) of 12 April, 1923.

1. Forms N. M. S. H. C. 1 and 5 have been revised and the new forms will be placed in use immediately upon receipt of same.

2. A request for a supply of the revised forms will be submitted at once to the naval medical supply depot, and when received use of the old forms will be discontinued.

F. L. PLEADWELL, *Acting.*

Circular letter.

WWB/d F-2-42022.

Serial No. 270-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 22, 1923.

To: All medical officers.

Subject: Form N. M. S. H. C. 2: Resumption of use of.

References: (a) Bu. M. & S. letter P-16-42022, PFD-MDC of 10 October, 1919, par. 3.

(b) Manual of the Medical Department, 1922, par. 402, as changed by M. & S. letter 128014(41) of April 12, 1923.

1. Reference (a) is canceled by reference (b).

2. A request for a supply of Form N. M. S. H. C. 2 will be submitted at once to the Naval medical supply depot.

3. One copy of this form will be prepared immediately upon receipt of this letter for all members of the Hospital Corps except those undergoing instruction in the Pharmacist's Mates' School, and the Hospital Corps Training School, Mare Island, Calif., and forwarded to the Bureau of Medicine and Surgery direct.

4. This initial report shall be prepared with care so that all information requested will be furnished the bureau, and all later reports shall be as complete as possible.

F. L. PLEADWELL, *Acting.*

WWB/d P-15-42022.

Circular letter.
Serial No. 269-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 21, 1923.

To: Commanding officers, naval hospitals; senior medical officers, ships and stations.

Subject: Advancement in rating of hospital corpsmen.

References: (a) Bunav Manual, Article D-4100 to 4104 (Change No. 2).

(b) Bunav circular letter No. 32-23 of 12 May, 1923.

(c) Bunav confidential letter N-6-Lo; 4111-1413-1 of 13 June, 1923.

1. The attention of all medical officers is directed to contents of reference (c) showing the serious shortage of hospital corpsmen in the pharmacist's mates' ratings and the exceedingly small number of hospital corpsmen of the forces afloat who were recommended for advancement in rating during May, 1923. The number of recommendations from shore stations indicates that, both ashore and afloat, hospital corpsmen are not being examined as soon as they become eligible for advancement.

2. The attention of all medical officers is directed to the changes regarding examinations for advancement, contained in reference (b).

3. In order to promote contentment, improve morale, encourage reenlistments, and decrease the shortage in the pharmacist's mates' ratings, it is directed that all hospital corpsmen be given an opportunity to take the examination for advancement in rating as soon as they satisfy all the requirements contained in reference (a) as modified by reference (b).

F. L. PLEADWELL, *Acting*.

WEE: SS 128014(63).

Circular letter.
Serial No. 268-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 18, 1923.

To: All medical officers.

Subject: Circular letters dated from December 9, 1919, to September 1, 1922: Obsolescence of.

1. Subjects covered by circular letters dated from December 9, 1919, to September 1, 1922, have been for the most part modified and included in the paragraphs of the Manual of the Medical Department, 1922, or have become obsolete or are dealt with anew in subsequent letters. Circular letters prior to No. 212, dated September 1, 1922, are therefore obsolete.

2. Therefore hereafter in correspondence and otherwise, reference should be made to the paragraph in the manual dealing with the subject under consideration and not with the circular letter. Circular letters subsequent to September 1, 1922, may be quoted for reference purposes, although the subjects of several have already been incorporated in the manual.

3. It is therefore desired that all medical officers take cognizance of this policy and refresh their files and reference.

F. L. PLEADWELL, *Acting*.

WSD/JBC 124942-O.

Circular letter.

Serial No. 267-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 18, 1923.

To: All naval hospitals; Naval Medical School, Washington, D. C.; naval dispensary, Navy Department, Washington, D. C.; post surgeon, marine barracks, Quantico, Va.; senior medical officer, naval training station, Hampton Roads, Va.

Subject: Saturday half holidays during summer months; leave.

References: (a) Alnavsta 6, June 13, 1923.

(b) Art. 404(6), (7), Naval Instructions, 1913.

1. In connection with above reference, attention is invited to the decision of the Comptroller of the Treasury (23 Comp. Dec. 192) regarding computations of periods of leave in which the so-called summer half holidays occur. Under this decision—

"The so-called Saturday 'half holidays' occurring in the summer season in a period of leave granted to an employee of a navy yard, etc., under the act of August 26, 1916, should be charged as full days of leave, since they are, as a matter of fact, not 'half holidays,' but are constituted by executive orders as full days of work, although being only four hours in length."

2. Under the same decision it was held that "Sundays occurring within periods of leave granted to employees of navy yards, etc., under the act of August 29, 1916, should, in the case of a per annum employee, be charged against such leave, but in case of a per diem employee, should not be so charged, unless said per diem employee is required to work on Sundays; and Sundays occurring at the beginning or ending of a leave period should not be so charged in the case of any employee, unless applied for and granted as days of leave."

3. Paragraph 1578(2), Navy Regulations, 1922, provides:

"Civil employees at naval hospitals paid on a per diem, per month, or pay annum basis shall be granted annual leave with pay and leave without pay in the same manner as per diem employees at navy yards and stations." (See M. & S. circular letter, Serial No. 43-1920, #124942-O(31), July 1, 1920.)

4. Although hospital employees are paid on a per monthly basis (equivalent to per annum), in accordance with instructions of the Secretary of the Navy and the provisions of the schedule of wages, their monthly pay is computed on a basis of 26 times the per diem pay of the equivalent yard rating, thus specifically eliminating pay for Sundays. Therefore, although, on account of their per month status, they may be required to work on Sundays in emergency and their daily pay is computed as one-thirtieth of their monthly pay, they can not be held to be "per annum" employees within the meaning of the comptroller's decision, and Sundays occurring within or at the beginning or end of periods of annual leave will not be charged.

F. L. PLEADWELL, *Acting*.

VITAL STATISTICS.

The "Monthly Health Index," which is published on the 15th of each month, contains the statistical data for individual ships and shore stations. The statistics appearing in this Bulletin are summaries compiled from those published in the "Monthly Health Index."

Annual rates, shown in the succeeding statistical table, are obtained as follows:

The total number of admissions to the sick list or the number of deaths reported during the period indicated is multiplied by $\frac{3.65}{x}$ or $\frac{3.65}{y}$ or 12, depending upon whether the period includes four or five weeks or a calendar month. The product is then multiplied by 1,000 and divided by the average complement.

E. R. STITT.

TABLE No. 1.—*Monthly report of morbidity in the United States Navy and Marine Corps for the month of June, 1923.*

	Forces afloat.	Forces ashore.	Entire Navy.	Marine Corps.
Average strength.....	74,446	38,594	113,040	19,943
All causes:				
Number of admissions.....	2,411	2,577	4,988	890
Annual rate per 1,000.....	328.63	810.24	529.48	580.15
Diseases only:				
Number of admissions.....	2,091	2,258	4,349	755
Annual rate per 1,000.....	337.05	702.06	461.65	492.15
Communicable disease, exclusive of venereal disease:				
Number of admissions.....	273	260	533	88
Annual rate per 1,000.....	44.00	80.84	56.58	57.36
Venereal disease:				
Number of admissions.....	726	319	1,045	156
Annual rate per 1,000.....	117.02	99.18	110.93	101.69
Injuries and poisons:				
Number of admissions.....	320	319	639	135
Annual rate per 1,000.....	51.58	99.18	67.83	88.00

TABLE No. 2.—*Number of admissions reported by Form F cards for certain diseases for the month of June, 1923.*

	Forces afloat, Navy and mar- ines (strength, 74,446).		Forces ashore, Navy and mar- ines (strength, 38,594).		Total (strength, 113,040).	
	Number of ad- missions.	Annual rate per 1,000.	Number of ad- missions.	Annual rate per 1,000.	Number of ad- missions.	Annual rate per 1,000.
Diseases.....	2,091	337.05	2,258	702.06	4,349	461.65
Injuries and poisons.....	320	51.58	319	99.18	639	67.83
Total admissions.....	2,411	328.63	2,577	801.24	4,988	529.48
Class III:						
Appendicitis, acute.....	48	7.74	45	13.99	93	9.87
Auto-intoxication, intestinal.....	6	.97	10	3.11	16	1.70
Cholangitis, acute.....	18	2.90	9	2.80	27	2.87
Cholecystitis, acute.....	4	.64	2	.62	6	.64
Cholelithiasis.....	0	0	1	.31	1	.11
Constipation.....	18	2.90	30	9.33	48	5.10
Enteritis, acute.....	8	1.29	25	7.77	33	3.50
Gastritis, acute catarrhal.....	8	1.29	7	2.18	15	1.59
Gastroenteritis.....	22	3.55	69	21.45	91	9.66
Hemorrhoids.....	25	4.03	19	5.91	44	4.67
Pharyngitis, acute.....	6	.97	22	6.84	28	2.97
Ulcer of duodenum.....	0	0	3	.93	3	.32
Ulcer of stomach.....	3	.48	1	.31	4	.42
Total.....	166	26.76	243	75.55	409	43.42
Class VII:						
Varicocele.....	11	1.77	5	1.55	16	1.70

TABLE No. 2.—Number of admissions reported by Form F cards for certain diseases for the month of June, 1923—Continued.

	Forces afloat, Navy and mar- ines (strength, 74,446).		Forces ashore, Navy and mar- ines (strength, 38,594).		Total (strength, 113,040).	
	Number of ad- missions.	Annual rate per 1,000.	Number of ad- missions.	Annual rate per 1,000.	Number of ad- missions.	Annual rate per 1,000.
Class VIII:						
Chicken pox.....	1	0.16	5	1.55	6	0.64
Diphtheria.....	1	.16	1	.31	2	.21
Influenza.....	72	11.61	61	18.97	133	14.12
Measles.....	29	4.67	64	19.90	93	9.87
Mumps.....	97	15.64	36	11.19	133	14.12
Pneumonia, broncho.....	6	.97	16	4.97	22	2.34
Pneumonia, lobar.....	12	1.93	6	1.87	18	1.91
Scarlet fever.....	1	.16	4	1.24	5	.53
Smallpox.....	1	.16	0	0	1	.11
Whooping cough.....	0	0	1	.31	1	.11
Total.....	220	35.46	194	60.32	414	43.95
Class IX:						
Dysentery, bacillary.....	0	0	4	1.24	4	.42
Dysentery, entamebic.....	1	.16	3	.93	4	.42
Total.....	1	.16	7	2.18	8	.85
Class X:						
Dengue.....	18	2.90	13	4.04	31	3.29
Filariasis.....	0	0	1	.31	1	.11
Malaria.....	25	4.03	33	10.26	58	6.16
Total.....	43	6.93	47	14.61	90	9.55
Class XI:						
Tuberculosis (all forms).....	9	1.45	12	3.73	21	2.23
Class XII:						
Chancroid.....	208	33.53	66	20.52	274	29.09
Gonococcus infection.....	479	77.21	198	61.56	677	71.86
Syphilis.....	39	6.29	55	17.10	94	9.98
Total.....	726	117.02	319	99.18	1,045	110.93
Class XVIII:						
Bronchitis, acute.....	66	10.64	187	58.14	253	26.86
Laryngitis, acute.....	2	.32	5	1.55	7	.74
Pleurisy, acute fibrinous.....	12	1.93	4	1.24	16	1.70
Rhinitis, acute.....	5	.81	9	2.80	14	1.49
Tonsillitis, acute follicular.....	180	29.01	151	46.95	331	35.14
Total.....	265	42.72	356	110.69	621	65.92
Class XX:						
Hernia.....	18	2.90	20	6.22	38	4.03

TABLE NO. 3.—*Summary of annual admission rates for venereal disease reported from ships for May and from various shore stations for the four-week period June 3 to June 30, 1923.*

	Annual rate per 1,000, May.			Average rate since Jan. 1, 1923.		
	Mini- mum rate.	Mean rate.	Maxi- mum rate.	Mini- mum rate.	Mean rate.	Maxi- mum rate.
All ships.....	0	164.73	1,777.78	13.57	147.82	1,471.70
Battleship and cruiser force—						
Scouting fleet.....	31.83	154.32	334.36	77.82	145.23	407.16
Battle fleet.....	25.40	62.12	108.56	55.73	85.63	206.46
Asiatic fleet.....	505.26	681.82	735.85	263.56	633.80	788.46
Destroyer squadrons—						
Scouting fleet.....	0	208.00	823.53	20.44	212.91	1,020.00
Battle fleet.....	0	61.67	352.94	22.47	91.87	181.22
Asiatic fleet.....	125.31	627.61	1,777.78	78.95	485.27	1,471.70
Miscellaneous—						
Scouting fleet.....	0	175.99	1,164.18	13.57	174.08	477.06
Battle fleet.....	0	176.01	626.09	26.84	150.34	338.03
Asiatic fleet.....	108.11	342.86	1,371.43	53.57	500.46	1,371.43
	Annual rate per 1,000, June 3 to June 30, 1923.			Average rate since Jan. 1, 1923.		
	Mini- mum rate.	Mean rate.	Maxi- mum rate.	Mini- mum rate.	Mean rate.	Maxi- mum rate.
All naval districts in the United States....	0	71.03	582.09	8.13	64.06	179.95
First naval district.....	12.36	65.71	202.49	43.16	52.98	96.77
Third naval district.....	0	53.35	120.65	8.13	54.44	111.39
Fourth naval district.....	78.78	136.17	185.23	84.70	134.80	179.95
Fifth naval district.....	0	62.42	104.29	53.79	73.79	81.57
Sixth naval district.....	42.46	79.15	582.09	41.39	47.26	126.46
Seventh naval district.....	0	0	0	13.21	13.21	13.21
Eighth naval district.....	0	0	62.13	58.03	70.08	72.68
Ninth naval district.....	103.04	60.41	103.04	47.34	47.34	47.34
Eleventh naval district.....	75.58	110.48	205.26	25.78	69.36	136.99
Twelfth naval district.....	24.24	72.97	118.76	48.66	75.48	92.66
Thirteenth naval district.....	0	111.64	240.24	33.68	71.87	123.77

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE.

	Per cent, May.		Per cent since Jan. 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All ships.....	65.52	8.30	65.51	8.70
Battleship and cruiser force—				
Scouting fleet.....	72.41	8.62	68.62	9.65
Battle fleet.....	81.72	11.83	70.09	12.35
Asiatic fleet.....	57.14	12.86	48.67	8.00
Destroyer squadron—				
Scouting fleet.....	59.09	6.36	62.74	8.36
Battle fleet.....	92.59	3.70	73.91	4.89
Asiatic fleet.....	57.00	4.00	61.54	5.43
Miscellaneous—				
Scouting fleet.....	62.82	5.77	62.14	6.48
Battle fleet.....	65.38	8.97	64.15	8.83
Asiatic fleet.....	51.51	21.21	53.33	8.89
<hr/>				
	Per cent June 3, to June 30, 1923.		Per cent since Jan. 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All naval districts in the United States.....	71.52	11.81	74.42	13.94
First naval district.....	68.42	15.78	79.21	6.93
Third naval district.....	81.81	19.19	75.00	14.06
Fourth naval district.....	60.00	13.33	72.34	7.45
Fifth naval district.....	75.00	8.33	69.35	15.59
Sixth naval district.....	50.00	0	63.26	14.29
Seventh naval district.....	0	0	100.00	0
Eighth naval district.....	75.00	25.00	82.35	8.82
Ninth naval district.....	50.00	50.00	78.56	21.43
Eleventh naval district.....	100.00	0	84.61	12.82
Twelfth naval district.....	77.78	11.11	81.45	12.58
Thirteenth naval district.....	66.67	22.22	82.86	14.29

TABLE NO. 4.—Number of admissions reported by Form F cards and annual rates per 1,000, entire Navy, for the four-week period June 3–30, 1923, inclusive.

Class.	Navy (strength, 93,097).		Marine Corps (strength, 19,943).		Total (strength, 113,040).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases of blood.....	2	0.28	0	0	2	0.23
Diseases of circulatory system.....	34	4.75	4	2.61	38	4.37
Diseases of digestive system.....	457	63.82	141	91.91	598	68.77
Diseases of ductless glands and spleen.....	2	.28	2	1.30	4	.46
Diseases of ear.....	75	10.47	16	10.43	91	10.47
Diseases of eye and adnexa.....	60	8.38	20	13.04	80	9.20
Diseases of genitourinary system (non-venereal).....	105	14.66	26	16.95	131	15.07
Communicable diseases transmissible by oral and nasal discharges.....	319	44.54	56	36.50	375	43.13
Communicable diseases transmissible by intestinal discharges.....	5	.70	3	1.96	8	.92
Communicable diseases transmissible by insects and other arthropods.....	53	7.40	29	18.90	82	9.43
Tuberculosis (all forms).....	19	2.65	0	0	19	2.18
Veneral diseases.....	785	109.62	156	101.69	941	108.22
Other diseases of infective type.....	198	27.65	70	45.63	268	30.82
Diseases of lymphatic system.....	46	6.42	15	9.78	61	7.02
Diseases of mind.....	29	4.05	7	4.56	36	4.14
Diseases of motor system.....	64	8.94	27	17.60	91	10.47
Diseases of nervous system.....	32	4.47	7	4.56	39	4.49
Diseases of respiratory system.....	670	93.56	106	69.10	776	89.24
Diseases of skin, hair, and nails.....	63	8.80	27	17.60	90	10.35
Hernia.....	32	4.47	6	3.91	38	4.37
Miscellaneous diseases and conditions.....	130	18.15	17	11.08	147	16.91
Parasites (fungi and certain animal parasites).....	78	10.89	19	12.39	97	11.16
Tumors.....	9	1.26	1	.65	10	1.15
Injuries.....	427	59.63	128	83.44	555	63.83
Poisons.....	24	3.35	7	4.56	31	3.57
Total.....	3,718	519.18	890	580.15	4,608	529.93

TABLE NO. 5.—Deaths reported, entire Navy, for the four-week period June 3 to June 30, 1923, inclusive.

Cause.	Navy (strength, 93,097).	Marine Corps (strength, 19,943).	Total (strength, 113,040).
Menigitis, cerebrospinal.....	1	0	1
Influenza.....	1	0	1
Pneumonia, broncho.....	1	0	1
Pneumonia, lobar.....	4	0	4
Tuberculosis, chronic pulmonary.....	1	0	1
Syphilis.....	1	0	1
Other diseases.....	7	2	9
Drowning.....	8	1	9
Other accidents and injuries.....	5	3	8
Poisons.....	2	0	2
Total.....	31	6	37
Annual death rates per 1,000, all causes.....	4.33	3.91	4.25
Annual death rates per 1,000, diseases only.....	2.23	1.30	2.07

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VOL. XIX

NO. 3

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PLANNING AND PUBLICATIONS
CAPTAIN D. N. CARPENTER, MEDICAL CORPS, U. S. NAVY
IN CHARGE

EDITED BY
LIEUTENANT COMMANDER W. M. KERR, MEDICAL CORPS, U. S. NAVY

SEPTEMBER, 1923
(MONTHLY)



Compiled and published under authority of Naval Appropriation Act
for 1924, approved January 23, 1923

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

Owing to the exhaustion of certain numbers of the BULLETIN and the frequent demands from libraries, etc., for copies to complete their files, the return of any of the following issues will be greatly appreciated:

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Volume VIII, No. 1, January, 1914.
Volume VIII, No. 3, July, 1914.
Volume VIII, No. 4, October, 1914.
Volume X, No. 1, January, 1916.
Volume XI, No. 1, January, 1917.
Volume XI, No. 3, July, 1917.
Volume XI, No. 4, October, 1917.
Volume XII, No. 1, January, 1918.
Volume XII, No. 3, July, 1918.

SUBSCRIPTION PRICE OF THE BULLETIN.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Yearly subscription, beginning January 1, \$1.50; for foreign subscription add \$1.00 for postage.

Single numbers, domestic, 15 cents; foreign, 24 cents, which includes foreign postage.

Exchange of publications will be extended to medical and scientific organizations, societies, laboratories, and journals. Communications on this subject should be addressed to the Surgeon General, United States Navy, Washington D. C.

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PREFACE.

The UNITED STATES NAVAL MEDICAL BULLETIN was first issued in April, 1907, as a means of supplying medical officers of the United States Navy with information regarding the advances which are continually being made in the medical sciences, and as a medium for the publication of accounts of special researches, observations, or experiences of individual medical officers.

It is the aim of the Bureau of Medicine and Surgery to furnish in each issue special articles relating to naval medicine, descriptions of suggested devices, clinical notes on interesting cases, editorial comment on current medical literature of special professional interest to the naval medical officer, reports from various sources, historical essays, notes and comments on topics of medical interest, and reviews or notices of the latest published medical books.

The bureau extends an invitation to all medical officers to prepare and forward, with a view to publication, contributions on subjects of interest to naval medical officers.

In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will send a letter of commendation to authors of papers of outstanding merit and will recommend that copies of such letters be made a part of the official records of the officers concerned.

The bureau does not necessarily undertake to indorse all views or opinions which may be expressed in the pages of this publication.

E. R. STITT,
Surgeon General United States Navy.

NOTICE TO SERVICE CONTRIBUTORS.

When contributions are typewritten, *double spacing* and wide margins are desirable. Fasteners which can not be removed without tearing the paper are an abomination. A large proportion of the articles submitted have an official form, such as letterheads, numbered paragraphs, and needless spacing between paragraphs, all of which require correction before going to press. The BULLETIN endeavors to follow a uniform style in headings and captions, and the editor can be spared much time and trouble and unnecessary errors can be obviated if authors will follow in the above particulars the practice of recent issues.

The greatest accuracy and fullness should be employed in all citations, as it has sometimes been necessary to decline articles otherwise desirable because it was impossible for the editor to understand or verify references, quotations, etc. The frequency of gross errors in orthography in many contributions is conclusive evidence that authors often fail to read over their manuscripts after they have been typewritten.

Contributions must be received two months prior to the date of the issue for which they are intended.

The editor is not responsible for the safe return of manuscripts and pictures. All materials supplied for illustrations, if not original, should be accompanied by a reference to the source and a statement as to whether or not reproduction has been authorized.

The BULLETIN intends to print *only original articles, translations, in whole or in part, reviews, and reports and notices of Government or departmental activities, official announcements, etc.* All original contributions are accepted on the assumption that they have not appeared previously and are not to be reprinted elsewhere without an understanding to that effect.

U. S. NAVAL MEDICAL BULLETIN

VOL. XIX.

SEPTEMBER, 1923.

No. 3.

SPECIAL ARTICLES.

FEAR AND WORRY.

By H. BUTTS, Lieutenant Commander, Medical Corps, United States Navy.

The article which follows does not pretend much more than to scratch the surface, so to speak, of the subject under discussion, but it is written with a view to a clearer understanding of two very commonly associated evils which cause so much unhappiness and distress, and with a view to their possible prevention, abolition, and treatment. I take this occasion to express my appreciation and indebtedness to Commander H. E. Odell, Medical Corps, United States Navy, who has given me several of his personal ideas and suggestions on the subject discussed, which have my hearty indorsement.

Fear and worry are two specters of the mind which cause illness, consume an enormous amount of needless energy, and in many cases probably shorten life. While closely related, and one may induce the other, they are not identical. They are both states of mind which are usually accompanied by a consciousness of weakness, sometimes a feeling of absolute helplessness, uncertainty, apprehension, and a loss of courage.

Inasmuch as they are definite etiological factors in the causation of several diseases, especially certain nervous diseases, like paralysis agitans, insanity, and the neuroses—neurasthenia, psychasthenia, and hysteria—as well as symptoms of these diseases after they become manifest, it is believed that time may well be spent in a consideration of the psychology and possible elimination of these two evils.

People differ greatly in their capacity for and manifestations of fear and worry. Some fortunate individuals are apparently fearless of anything or any combination of circumstances, and they never seem to worry about anything. These people are not necessarily careless, though many of them are, and some of them have

extraordinary ability along certain lines. Generally speaking, however, it is not believed that any great compliment is paid to a man to say of him that he is fearless, for such a man may usually be expected to embark on hazardous undertakings or rush into foolish enterprises where angels would fear to tread. One of the puns of the World War was to the effect that an individual must necessarily have been "very careless" in order to win a Victoria cross for extraordinary heroism. As a matter of fact, probably no one is absolutely fearless, and everyone has certain fears of one kind or another.

Other individuals seem to be always in a state of fear about something or other and are almost always in a continual state of worry about what may happen. Quoting from White and Jelliffe's *Modern Treatment of Nervous and Mental Diseases*, there are "those who seem to be afraid to act, to take a chance, either because of some positive fear or because of a vague feeling that any action is dangerous." Some people who are physically well developed, in an excellent state of health, and apparently well able to take care of themselves, are seemingly always constitutional cowards, while others who are underdeveloped, perhaps cripples or deformed, or in a poor state of health—persons we might reasonably expect to be cowards—are really constitutional heroes, from whom one never hears a word of complaint, fear, or worry. Guynemer, the French "ace of aces," it seems to the writer, was an example of this latter type of hero. Of poor physique, he was found unacceptable for enlistment in the French Army at a time when France needed every available man. He finally managed to enroll in the aviation service; and though at times so ill that he had to be helped into and out of his airplane, he was credited at the time of his death in service with having shot or brought down in flames more than 100 enemy planes.

Certain sorts and degrees of fear are really very valuable economic and moral factors in the life of the human race. For instance, it is said that "the fear of God is the beginning of wisdom." Certain sorts of fear, not carried to an extreme degree, engender caution, teach deliberation, develop judgment, and cause us to hesitate about taking hasty action. If it were literally true that certain individuals feared nothing, they would, one may safely assert, never take any steps to avoid actions which their judgment and experience had taught them had resulted unpleasantly, painfully, perhaps disastrously, in the past. It must be admitted, however, that fear is a relative term, to which people react very differently, and what will frighten some individuals into action of some sort or another will have no influence whatever upon others.

Long and intimate contact with the object or conditions feared will sometimes lessen or entirely dissipate the original fear, partly

because of the principle that "familiarity breeds contempt," aided perhaps by greater knowledge of the object or conditions feared. On the other hand, it frequently happens that no amount of familiarity, increased knowledge, or intimate contact with the object or conditions feared will serve to lessen it; quite the contrary, familiarity or knowledge may even increase the degree of fear felt. Much depends upon the character of the individual affected by the fear.

Some fears in greater or less degree are common to the entire human race. One of these is the fear of high places. A great many people do not care to look over a high precipice into the depths below, as such an experience causes them to become anxious, dizzy, and very uncomfortable. Curiously, many of those same individuals can frequently, in fact generally, ascend to great heights in an airplane with very little, if any, feeling of discomfort on account of the height attained. This paradox can probably best be explained by the fact that when comfortably strapped into the seat of an airplane the individual affected by the fear of high places acquires a sort of false feeling of security which effectively abolishes any thought of fear, at least so far as it relates to his being in a high place.

It would seem that fear and worry are both acquired characteristics. They are not congenital, though heredity probably has considerable influence in their development. The new-born babe has no fear and it does not worry, though it may very early acquire these evil states of mind, especially when subjected to conditions which favor their development. The degree of fear and worry which any individual may develop seems to depend much more upon environmental influences than upon hereditary factors. Dr. Boris Sidis, in his little book on *Philistine and Genius*, is authority for the statement that "a person brought up in the school of fear and blind obedience lacks steadiness of purpose, courage, independence, critical judgment, and becomes bigoted. He falls an easy prey to the suggestions of his times and surroundings, and succumbs to the influence of unscrupulous leaders. Such a person lacks mental and moral poise, he is wanting in the true courage of reason, present in the fully developed man and woman. He can not withstand the pressure of social opinion, being unable to stand by his post in the face of threatening social opposition. Ruled by fear at home, he is governed by terror in society. He is afraid of social punishment, of 'losing face,' as the Chinese say, with his neighbors, gossips, circles, and clubs."

Parenthetically, it may be mentioned that dumb brutes manifest a great difference in their attitude toward fear and worry, even in the same species. Some animals, like deer, for example, are always timid, and all wild animals, including the lion, the "king of beasts," seem to fear man. With certain exceptions, however, it is

believed that fear and worry seldom become highly developed in dumb brutes, the reason probably being, as Schopenhauer points out in *Studies in Pessimism*, that "what elements of fear and hope exist in the brutes—and they do not go very far—arise only in relation to objects that lie before it and within reach of those impulses: whereas a man's range of vision embraces the whole of his life and extends far into the past and future."

The belief is yet firm in the minds of many people, some of them physicians, that severe emotional experiences like fear and worry operate unfavorably upon the unborn child. Legrand du Saulle observed that among children born during the siege of Paris in 1870, the so-called "*enfants de siege*," there was a relatively large number who were physically and mentally retarded. However, Scholz, in his work on *Anomale Kinder*, states that we can only conjecture, but not prove, that these prenatal emotional influences per se injure the unborn child, and reminds us that there are hundreds of thousands of mothers who live under certainly not enviable economic conditions and yet bear strong children. He considers hereditary taint plus alcoholism and syphilis to be the most significant factor in the bringing into the world of mentally and physically defective children, and states that the assertion that "fright" of the pregnant mother from the sight of a misformed idiot or epileptic may give rise to a defective child belongs well within the realm of superstition. He knows of not a single authentic case of this nature.

Fear is defined by the *Standard Dictionary* as "an emotion excited by threatening evil or impending pain, accompanied by a desire to avoid or escape it; apprehension, dread; uneasiness about a thing; solicitude, accompanied with dread." A second definition is "reverence for constituted authority, especially when accompanied by obedience thereto, as the fear of God." Synonyms for fear are "alarm, apprehension, awe, consternation, dismay, dread, fright, horror, misgiving, solicitude, terror, timidity, trepidation."

Worry is defined by the same authority as "uneasiness in mind by reason of care or solicitude," and synonyms for worry are "annoy, badger, bother, persecute." Other meanings are given to these words, but for the purposes of this paper the above definitions will suffice.

Much has been written about the psychology of fear and worry as emotions and states of mind, but in the last analysis they can generally be said to rest upon ignorance or incomplete knowledge, and as our knowledge of the subject feared or about which we worry becomes more exact or complete the fear or worry gradually assumes less importance in our consciousness and may, though not necessarily, wholly disappear.

Abnormal fears are usually known in medical nomenclature as "phobias," as related to the state of mind in which they occur.

These "phobias" are of various kinds, and, according to Church and Peterson, in their work on Nervous and Mental Diseases, Janet has laboriously tabulated them as "fears regarding the body; fears of objects; fears of situations, physical and social; and fears of certain ideas." Under these heads he has listed over 40 different varieties, with innumerable variations. The Greek language has been searched to find sufficient names for the phobias. Claustrophobia, fear of closed spaces; agoraphobia, fear of open spaces; amaxophobia, fear of vehicles; misophobia, fear of dirt; and a hundred others testify to the range of human feeling and the wealth of the Hellenic tongue." The individuals who suffer with these "phobias" generally have other mental symptoms associated with them and are usually regarded as being afflicted with a nervous disease, or neurcsis, known as psychasthenia, a disease which occupies a sort of middle ground between nervous disease and outspoken insanity. These "phobias" also occur in the so-called "anxiety neuroses," and are often one of several symptoms of the psychoses.

The part which fear and worry play in the general etiology of insanity may be described as secondary to the primary influence which heredity bears to this malady. Again quoting Church and Peterson:

"The etiology of insanity is describable in two terms, 'heredity' and 'strain'—heredity, which renders the nervous system unstable, and strain, which causes the unstable nervous centers to collapse. Instances of insanity developing in individuals with properly balanced and adjusted nervous organizations are rare indeed * * *. About 24 per cent of all cases of insanity are ascribed to moral causes, among which are classed domestic troubles, grief from death of friends, business worries, anger, religious excitement, love affairs, fright, and nervous shock. The percentage is greater in women than in men. It is doubtful if any emotion alone can overcome the stability of a normal nervous system; hence it is in the fragile, nervous constitution or individuals tainted by heredity that extreme emotions are wont to exert their malign influence * * *. Some acute psychoses may be suddenly developed by fright, or a transitory emotional insanity for a few hours or for a few days in duration. Among the symptoms are mutism, or incoherence, confusion, isolated hallucinations, delusions, with impulses to violence, wandering, followed later by complete or nearly complete amnesia.

"The more slowly working effects like sorrow and worry often aid in the evolution of melancholia, paralytic dementia, or acute or chronic paranoia. We have come to believe that insanity is more often of psychogenic origin than we formerly supposed."

But it is not with these pathological fears and "phobias," which are part and parcel of disease entities, with which we are here

chiefly concerned. It is the little fears and the little worries which form so much a part of the everyday existence of so many people, which are so useless, so unprofitable, and so nerve racking, which are a form of mental inefficiency, and which are so often needlessly multiplied until they are of tremendous importance that we would here consider. Those whose fears and worries have reached such a stage as to become pathological usually require special treatment by a competent physician, and no amount of reasoning or philosophization will ordinarily alone serve to restore the patient to normality. Besides there are many individuals who are usually regarded as normal to whom the principles of practical wisdom do not appeal, and who will have to be reached by suggestion and other measures unnecessary to enumerate here. Nevertheless there is a sufficiently large class of credulous people to whom Doctor Coue's formula of "growing better every day in every way" makes appeal, which makes it well worth a physician's time to use every means of autosuggestion to favorably influence them.

The number of conditions, circumstances, or predicaments about which human beings will worry is astonishingly large and will range from such momentous questions as the destiny of their immortal souls, daily bread, the welfare of themselves or their dependents, or the fidelity of wife, husband, or friends to insignificant or even ridiculous questions such as worry as to the date upon which the world will come to an end, the temperature of hell, whether Adam did or did not have a navel, whether the doors were locked prior to going to bed, whether a letter which has been mailed was or was not properly stamped and addressed, whether the right thing was said or a right line of action was adopted on a certain occasion, whether or not offense was given, etc., ad infinitum.

Many people spend much time worrying about their "sins," and they are readily converted into cowards by "the still small voice of conscience." The lives of some of these people are so narrow and their souls so small that a large proportion of their time is spent in seeking to avoid evil. They are so obsessed with the enormity of and the dreadful consequences of their sins of omission that they have very little time for sins of commission. On this account they seldom accomplish much, and on the whole are really quite pitiable creatures.

The fear of what people may say, already referred to, acts with many as a sort of balance wheel or safety valve on their conduct, inducing some to preserve a correct and proper line of action, at least in so far as their intelligence enables them to do so, and some to imitate others in order to avoid or escape criticism. In other words, this fear develops a sort of faculty of self-critique.

It is a moot question as to whether or not the fear of punishment is a deterrent of crime, at least so far as the criminal himself is concerned. In some cases it seems to act as a very effective prophylactic against crime and a remedy for its recommission. In other cases, and these are quite numerous, it does not seem to have the slightest influence in this respect. Almost any large penitentiary or prison has a certain number of antisocial recidivists upon whom the fear of punishment apparently has no effect. So far as society itself is concerned it can not be doubted that the fear of punishment deters thousands from the commission of crime, and this really is the chief object of punishment—not that the criminal himself will be greatly affected thereby, though he may be, but that others will hesitate to commit, or fail to commit, the same crimes.

Worry and discouragement about being unable to secure employment, when continued over a long period of time, has been known to sear the souls of middle-aged and elderly people who had previously been regarded as normal. One would probably have to pass through this experience of hunger, weariness, and discouragement to fully appreciate its import. To have the privilege of earning daily bread denied, to tramp wearily day after day about a great city like New York, to encounter keen competition, to be obliged to match wits with others who are younger and perhaps brighter, and to have every avenue of employment apparently closed against one is a harrowing experience, to say the least, one which would probably try anyone's mettle. It is no wonder that some emerge from such an experience moral cowards for the balance of their lives, afraid to give up or abandon a job once found, quaking with fear if discharged, and fearful to venture forth to secure a better job.

Reference has already been made to fear of certain sorts and degrees as an economic and moral asset. Worry, on the other hand, is believed to be an unmixed evil. It does not in any way seem to improve or promote the health, comfort, or well being of the human race.

Those who adopt the "worry habit" are usually, though not always, more or less neurotic, and their habit of worrying is an expression of their type of mental reaction toward inimical conditions and circumstances. They may or may not think much, but reflect little, and unfortunately are least amenable to philosophical reasoning. They are mentally so constituted that they can see only their point of view, and they will continue to worry until the conditions or circumstances which cause the fear or worry improve or the cause disappears.

Like most vicious habits, the "worry habit" is very easily and often quite unconsciously formed. And it is very difficult to break.

One who has formed the "worry habit" can in an incredibly short time hypnotize himself into the belief that he is a desperately sick individual, and he readily becomes a sort of "clinging vine," a whiner for sympathy. The world is full of such people. They lack moral stamina, and instead of being the useful, helpful citizens they might be, they are really social parasites.

The morbid anatomy or pathology of fear and worry considered as diseases, for they are sometimes almost equivalent to diseases, though not usually described as such in textbooks, is difficult to describe in such a way as to include both mild and severe cases. We have all heard of (though perhaps never seen) people who have had their hair whitened in a single night of intense fear, and are familiar with the look of terror upon the face of one who has been subjected to the emotion of great fear. We are also familiar with the anxious blanched facial expression, the lines upon the face, the appearance of age, the nervous restless manner, the grayish or whitened hair, and the cheerless voice of those who worry a great deal. If we could read the story which the neurons of the neurasthenic or the psychasthenic might tell, we could also probably read the pathology of fear and worry.

The symptomatology of fear and worry, considered as diseases, can probably best be described by relating one or two hypothetical but typical examples. We will first take the case of the woman who fears that her husband is untrue to her and who worries about it. Whether her fear is well founded or not makes no difference, the result is the same. What happens? First of all she becomes jealous and suspicious. She spends a lot of time seeking and accumulating evidence to support her suspicions of infidelity. She becomes overcredulous, unhappy, irritable, takes offense easily, is morose, ill-tempered, peevish, and uncompanionable. She looks for ulterior motives in many things her husband does, and her friends and relatives note a decided change in her character. This condition may continue for months, even years. Her state of unhappiness has been greatly accentuated by habitual worry. She may have read extensively on "marriage and divorce," consulted lawyers and friends in whom she still retains some confidence, and she may or may not have consulted clairvoyants, palmists, or trance mediums, depending upon her degree of intelligence and credulity. What is the end result? Judging from thousands of similar cases, she adopts one of six lines of action: Commits suicide, murders her unfaithful husband or his correspondent, becomes a nervous wreck or insane, seeks and obtains a divorce, leaves her husband's home and lives apart, or continues a miserable existence with him until he or she dies. What worth while, we well may ask, has been accomplished by the months

and years of this woman's worry? Answer, nothing! Instead of devoting a reasonable and judicious amount of time and effort in an investigation of her husband's conduct in order to confirm her suspicions and then taking appropriate action in the common-sense measure of separation or divorce, in case her suspicions are confirmed, she may by worrying have permitted herself to become a nervous wreck or insane. Granting, for the sake of argument, that the woman has had abundant cause for worry, we will search in vain for any good purpose or effects it has served.

In most cases of this sort it would perhaps be idle to suggest to this woman that "there are finer fish in the sea than were ever caught;" that her idol's feet are made of clay, and therefore he is unworthy of her worry; and that any faithless man or woman is unworthy of weeks and months of luxurious worry. Furthermore, such advice would be evidence of ignorance on the part of the giver of the nature or psychology of human affection. There are many who believe that a woman really loves but once, and that, as the late W. C. Brann opines in his *Iconoclast*, "every daughter of Eve dreams of an ideal, of a man tender and true, who will fill her life with love's own melody, his word her law, his home her heaven, his honor her glory, and his tomb her grave—a man to whom her heart turns as the helianthus to the sun." If this belief is true, one can readily imagine what havoc is wrought in the soul of the woman whose affection has been misplaced upon an unworthy object, and how feeble and impotent any words of advice might be as to a course of action for her. One can only endeavor to convince her of the uselessness of worry, and try to shorten its period of duration for her. Any success attained will depend largely upon the confidence she has in her adviser, and upon the degree of intelligence and common sense which she herself possesses.

Let us take another but less serious example of fear and worry. A mother has an only son who is married, lives in a distant city, and is, let us assume, an aviator in the naval service. Ever since he became a "bird man" she has worried about a "premonition" she thought she had that her son might meet with a sudden and violent death, which, we must confess, is not beyond the range of possibility, considering her son's occupation. Eventually she receives a telegram from his city, and because of the abnormal mental state into which she has converted herself through weeks and months of worry she is afraid to even open or read her telegram. Instead she becomes hysterical, weeps, wrings her hands, and walks the floor for a season until some one kindly reads the telegram to her, the simple message being "Nine-pound boy born to-day. Mother and baby doing well." To some this hypothetical case may seem overdrawn, but it is not.

It is really astonishing how little common sense some people exercise, and these are the very people who fear and worry the most about what may happen. And even though time and experience should teach them that in the great majority of cases their fears are groundless, they do not profit by that experience to the extent of ceasing to worry. They have acquired the habit, and they seem unable to break it.

Curiously, many people worry about and fear death, the inevitable end of all who live, while others do not consider life worth living and commit suicide, claiming during life that the few joys and pleasures derived from living are greatly overbalanced by the toil necessary to make life possible, and that the pains of disease and injury, the infirmities of age, the disappointments, discouragements, heartaches, losses, and agonies of mind to which everyone who lives must submit make life a constantly losing venture. They apparently welcome death as a happy release from all unpleasantness and responsibility. "O Death, where is thy sting? O Grave, where is thy victory?" Still others are only deterred from suicide because they either lack the courage to commit the act or they consider it "nobler in the mind to suffer the slings and arrows of outrageous fortune than to take up arms against a sea of troubles and by opposing end them." Then, too, the belief in immortality deters many from committing the act, because of their fear of "what dreams may come when we have shuffled off this mortal coil," and they prefer rather to "bear those ills we have than to fly to others we know not of."

According to John J. Ingalls, late Senator from Kansas, in his famous funeral oration on Ben Hill, "if the incompleteness of every career, even the longest and most fortunate, be not supplemented and perfected after its termination here, then he who dreads to die should fear to live, for life is a tragedy more desolate and inexplicable than death." To most of us death is undeniably a sad, a depressing affair, because it means the cessation of all useful earthly activity, so far as the deceased is concerned, and because we miss the "touch of the vanished hand and the sound of the voice that is still," but to a philosophical mind it is not a subject for fear or worry. In the large majority of cases, it is, so far as competent medical men can ascertain, nearly or quite painless, and should be a welcome relief for the aged whose life's work is finished; the insane or those racked with painful or incurable diseases like advanced tuberculosis, leprosy, or cancer. To such it should, indeed, be a boon and a privilege to "wrap the drapery of their couches about them and to lie down to pleasant dreams." Probably the saddest of all deaths is that of a little child which had promise of a bright future. But in any event, fear and worry about either life or death are wholly use-

less and extremely unprofitable. To no mortal man has been vouchsafed the privilege of lifting the somber veil of death to actually see what lies beyond his grave, spiritualists, slate writers, and trance mediums to the contrary notwithstanding. And no matter what our conception of our hereafter may be, it is absolutely idle for us to speculate and worry, as countless thousands do, about those "unsolved and unsolvable problems of mortal life and human destiny which prompted the troubled patriarch to ask that momentous question for which the ages have given no answer: "If a man die, shall he live again?" In her beautiful little poem on "Life," Mrs. A. L. Barbould expresses, it seems to the writer, the proper attitude of a sane individual toward life and death:

Life, I know not what thou art,
But know that thou and I must part;
And when, or how, we met
I own to me's a secret yet.

Life, we've been so long together,
Thro' pleasant and thro' cloudy weather.
'Tis hard to part when friends are dear—
'Twill cost, perhaps, a sigh, a tear.

Then steal away, give little warning,
Choose thine own time; say not "Good night,"
But in some fairer clime
Bid me "Good morning."

Many people make an unduly high estimate of their value in the world, anyway, and their importance in the economic scheme of "things as they are." On this account they worry needlessly. Again quoting from *The Iconoclast*, "where will the archeologists of the year 12896 turn for the history of our time—where search for those 'few immortal names that were not born to die'?" * * * Long before Macaulay's New Zealander stands on a broken arch of London Bridge to sketch the ruins of St. Paul's every book now extant will have perished. * * * No race or nation of which we have any record has avoided a recrudescence of barbarism for a hundred generations. * * * The mighty Washington has not been dead (much over) a hundred years, yet has already become—as R. G. Ingersoll informs us—'merely a steel engraving.' * * * Our proud Republic, our boasted civilization will pass, for change is the order of the universe. What records will they leave behind? What is to prevent them from being utterly forgotten, as were the predecessors of Sargon, the most ancient Chaldean monarch mentioned in the Bible? * * * Is it not a trifle startling to reflect of how little real importance all our feverish work and worry is, and

how small a space it is ordained to occupy in the mighty epic of mankind? ”

Is it not the part of wisdom to be happy and content in doing the best we can, without hurry, fear, or worry as to the result? The best that can be said of anyone's work is that it has served to increase human happiness or decrease, alleviate, or abolish some human misery. Certainly nothing can be gained, and much can be lost, by worrying ourselves and others about what can not be remedied. The great Abraham Lincoln's common-sense philosophy can not be improved: "I do the very best I know how—the very best I can; and I mean to keep doing so to the end. If the end brings me out all right, what is said against me won't amount to anything. If the end brings me out wrong, ten angels swearing I was right would make no difference."

Worry is often associated with hurry, the so-called "American disease." Indeed, the hurry is often the chief cause of the worry, and if people refrained from hurry there would be less occasion for worry. The truly great man or woman seldom or never hurries or worries, and usually he or she is a hero of some sort or other. It has been said that when one finds it necessary to hurry and fret over a piece of work or an undertaking he is endeavoring to accomplish or complete, the very fact that he hurries and worries about it is certain evidence that that particular piece of work or enterprise is too big for him. Columbus did not hurry to discover this continent, and there is little, if any, evidence that he was worried by the entreaties of his cowardly, mutinous sailors to turn back; instead, according to Joaquin Miller, he gave to the world he gained its grandest lesson: "On and on!" Probably no man ever had more responsibilities and cares to harass and worry him than did Abraham Lincoln, yet in the enormous published bibliography on his life there are very few references which indicate that he ever indulged in useless worry or fumed and fretted about his own and other's mistakes. It is true that he was always melancholy by nature, that he fairly haunted the Washington telegraph office for news of the Civil War, that he occasionally sat up all night calmly thinking out solutions for some of the many momentous questions with which he had to deal, and that toward the end of the Civil War his face was lined and furrowed with the wrinkles of care, but he always had a saving sense of humor, had an unusually large stock of common sense, and he was an avowed fatalist, believing, as he often said, that what is to be will be regardless of anything we may do or, rather, "I have found all my life, as Hamlet says, 'There's a divinity that shapes our ends, rough hew them how we will.'"

That Lincoln indulged very little, if at all, in the luxury of worry is only one of a thousand evidences of his greatness. Had he allowed himself to fume and fret over the inertia and incompetence of some of his generals, the reverses and slow progress of the war, the disloyalty of certain of his Cabinet members, and the importunities of office seekers, it is unlikely that he would have survived his first term as President. As for fear on the part of the "rail splitter," we may simply say that certainly no coward ever wrote the Emancipation Proclamation and made it become effective against tremendous opposition. It is doubtful whether Gen. U. S. Grant ever hurried or worried to any great extent, or was possessed of a fearful soul—certainly not in his famous siege of Vicksburg, which was characterized by "masterly inactivity," or "watchful waiting," whichever phrase is preferred.

It will occasionally happen that an able physician will be accused of having grown callous to suffering, of being "stony hearted," and of caring little, if anything, what happens, because he refuses to hurry to or to worry about his patients, while hysterical friends and relatives are literally "tearing their hair," wringing their hands, weeping and praying, running aimlessly about, and beseeching him to hurry or to "do something," when in truth he is doing all that can be done, and his nobility of character is shown in his uniform calmness, his "poker face," and his refusal to worry or to become excited, though he is unsparing in his sympathy for those less masters of themselves than he. Such a physician at least approximates the man described in Kipling's If:

If you can keep your head when all about you
Are losing theirs and blaming it on you;
If you can trust yourself when all men doubt you,
But make allowances for their doubting too.
If you can fill the unforgiving minute
With sixty seconds of distance run,
Yours is the earth and everything that is in it,
And—which is more—you'll be a man, some day, my son.

Having described some of the many manifestations of fear and worry and noted some of the far-reaching effects they have on the human mechanism, we may now properly consider what can be done and what measures we may adopt with a view to lessening in some degree, or even abolishing, these two evils. However, it would be too much to expect that any amount of philosophization or training in habit formation would make heroes of cowards or that inherited or constitutional tendencies could be wholly overcome, but it is believed that much can be done to improve the morale of timid individuals

who worry needlessly, with resulting great benefit to their physical, mental, emotional, and moral well-being.

People seek to relieve or alleviate their fears and worries in many and various ways. The mental suffering of these unfortunates is often very acute, and sometimes as the result of this suffering they commit suicide, murder, and other crimes. Clairvoyants, psychics, palm readers, crystal gazers, card readers, trance mediums, spiritualists, slate writers, sorcerers, table rappers, and other varieties of "fortune tellers" often derive a fair to excellent living by catering to the hopes and fears of those addicted to the worry habit, and because of their own credulity in believing these soothsayers some people claim to have been greatly benefited by consulting them. Unfortunately, the soothsayers usually manage in some way or other to foster the fears and worries of their clients, though perhaps giving, through fictitious assurance, some relief for the moment.

Some people who wish to brace up their courage before beginning a hazardous undertaking which they fear they may fail to accomplish resort to the use of alcohol in the form of a "bracer," as they call it, and delude themselves into the belief that they are benefited thereby. As is now pretty well known and accepted as fact, alcohol is from first to last a depressant, and what these people have really accomplished by their "bracer" has been a deadening of their sense of fatigue and a dulling of their critical judgment sense, and as a result they have made themselves less capable of withstanding prolonged or severe strain on their nervous systems than they would have been had they taken no alcohol.

Those who are religiously inclined frequently find relief for their worries and fears through the medium of prayer or the confessional. But in order for this method of relieving the mental pain due to fear and worry to be effective, it is absolutely necessary for the unfortunate to have faith and confidence that his prayer will be answered to his satisfaction, a consummation not always attainable. It would seem that a sincere Christian has no business worrying anyhow, for if he really trusts in God, as he says he does, his faith should cause him to believe that God knows how to run the universe without any outside assistance and that "sometime we'll understand."

Some individuals can find relief from fear and worry by intense mental or physical activity, which gives relief through the mental mechanism of forgetting. This, too, is not always effective, and the relief is usually but temporary, for with the cessation of mental or physical activity the fear or worry reappears to the mind.

A complete change of interest or occupation will sometimes accomplish the same happy result. Elizabeth Barrett Browning has beautifully expressed this principle in the lines:

The little cares that fretted me,
I lost them yesterday
Among the fields above the sea,
Among the winds at play;
Among the lowing of the herds,
The rustling of the trees,
Among the singing of the birds,
The humming of the bees.

The foolish fears of what may happen,
I cast them all away
Among the clover-scented grass,
Among the new-mown hay;
Among the husking of the corn
Where drowsy poppies nod,
Where ill thoughts die and good are born,
Out in the fields with God.

Harrington Emerson states that fear and worry "expand mental and nervous power far more rapidly than any other form of mental activity. A day or two of worry leaves you utterly exhausted, whereas intense mental concentration upon constructive work in which you are interested and which gives you pleasure causes scarcely any feeling of weariness. Worry accomplishes nothing worth while.

"Fear and worry are often the result of neglect or refusal to apply certain of the principles of personal efficiency. If you have no adequate and reliable records for your guidance, no matter what you are doing, you are in a state of uncertainty, and it is very easy to fall into the habit of worry. Worry is caused by a lack of definite plans, no schedules, and deficient dispatching. A man who blunders along from one task to another, entirely the creature of circumstances as they arise, is a prey to all kinds of misgivings as to his future. A man who has planned his future—knows what he is going to do and what results he intends to attain—is relieved from uncertainty and worry. The man who has no schedules, but goes through his day's work in a hit-or-miss, haphazard manner, frittering away half his time on insignificant and inconsequential things, and then suddenly finds that he is without sufficient time for the important duty, is an easy victim of the worry habit. But the man who has a definite time assigned to each task, determined in advance according to definite standards, has his mind relieved of all uncertainty and misgivings as to whether or not he will have time for what he has to do.

"The man who procrastinates, putting off and dreading his duties, and missing many of his recreations and pleasures because he does not do things on time, is often in a constant state of mental unrest. But the man who dispatches all he has to do promptly—does every-

thing in apple-pie order, 'shipshape—has a mind free from tension. A great deal of fear and worry is due to unstandardized conditions, from within and without.

"There is no mental or physical condition more fruitful of negative feelings than that of disorder. The man whose thoughts are disorderly, unsystematic, loose, unstandardized, is in a continual state of blundering, bad judgment, uncertainty, and, if he is capable of thinking, has fear and worry. The same is true of the man or the woman whose home, whose place of business, whose desk or workshop, is in a continual state of disorder and lack of system. Unstandardized operations of any kind are always uncertain as to their results. The man whose operations have not been standardized is therefore never sure of the outcome of any undertaking.

"Fundamental, perhaps, to all of this lax, vague, uncertain, and unstandardized thought and action is the lack of clear, definite, detailed ideals."

While the application of the principles just enumerated will undoubtedly prevent much fear and worry, they are neither a panacea nor a specific cure for all fear and worry.

Those who are capable of looking at life philosophically should find in it no occasion for worry. We are all certain to die some time—we can not live forever—and it would be unreasonable to expect never to feel any pain or discomfort, or to be ill. These conditions are an inseparable part of life. And we are all certain to lose money, our fortune, and our relatives and friends some time. Otherwise our continued freedom from loss, pain, and discomfort would be phenomenal. These things are inevitable, predestined, if we please. So why make ourselves sick by worrying about them? Worrying about inimical conditions will do no good, but on the contrary much harm. One might almost be justified in saying that the man or woman who can not look these conditions square in the face is unfit to survive.

To some minds partial immunity from worry and fear is conferred by the doctrine of fatalism—that all events are absolutely predetermined by divine will, so that human choice can not change or influence them, as held by Mohammedanism, or that all events, including human choice, are absolutely predetermined in a mechanical way by their antecedent causes. If this doctrine be true, as millions of people hold that it is, there is absolutely no occasion for worry about anything, for nothing that any human being can do can either help or hinder any or all predetermined events from taking place, and we are helpless. Reference has already been made to the fact that the great Abraham Lincoln was an avowed fatalist. This doctrine abolishes any belief in freedom of the will, and, if it be true,

"preparedness" of any sort is a farce and a fallacy, and all prophylactic measures against ill or disastrous results are absolutely useless, because "if a thing is going to happen it will happen," and nothing any human being can do will stay or avert it. Scientific experiment and the experience of mankind do not support this doctrine, and most Anglo-Saxons adopt the doctrine of necessarianism or determinism, which holds that all volitions are determined by antecedent causes, especially in the form of motives, that produce their results as invariably as do physical forces.

It would be quite fitting and proper for those fearful souls who are addicted to the worry habit to study the lives of great men and women and to note the manner in which they met and reacted to crises and situations which might be expected to cause fear and worry in susceptible individuals. A study of these lives, especially those we admire, can not prove otherwise than beneficial, and if the lessons of history and the lives of great men and women are to teach us anything they should at least remind us that we should endeavor to "make our lives sublime, and departing leave behind us footprints on the sands of time, footprints that perhaps another, sailing o'er life's solemn main, seeing * * * may take heart again."

It must be admitted that there is very little rhyme or reason to fear, and on this account we can not expect to accomplish very much in the way of lessening or abolishing it by an appeal to reason. If we could we would probably have better success in overcoming the unreasonable fears of those who scream with terror at the sight of a mouse, a spider, cockroach, or harmless little garden snake. To those, however, to whom the principles of practical wisdom do appeal, we can reasonably hope to accomplish more in averting or breaking up the worry habit. To this end it is well to impress upon the minds of those who worry as indelibly as possible certain short axiomatic sayings which are suggestive of the uselessness and folly of fear and worry. Among these the writer has found the following to be of service: "Our worst troubles are those which never happen." "What we don't know can not possibly hurt us." "Time solves many problems." "To-day is the to-morrow that we worried about yesterday—and nothing has happened." The thoughtful physician should explain, demonstrate, and illustrate to his worry-habit patients the truths contained in these and other suggestive axioms in such a way that they can not fail to remember them, and he should take every fitting occasion to bring them forcibly and emphatically to the attention of such patients. In this way certain worry patients who are not much given to thinking and reflection will be trained to do these things for themselves and will gradually develop a sort of philosophy of life which should aid them greatly in overcoming the worry habit.

Hand in hand with the training to think and to reflect should go training and practices in doing all things deliberately and without hurry, so that deliberate action on the part of these patients becomes habitual. Emphasis should be laid upon the fact that hurry promotes and causes worry, and that a task which has to be hurried is more difficult to perform, and it is very apt to be poorly done, or even completely spoiled or damaged. So, beyond a possible saving of a little time, nothing is to be gained by hurry and much may be lost. To avoid having to hurry one should always allow himself plenty of time to accomplish what he desires to do, and then there will be no occasion for hurry, worry, and poor workmanship.

It may be advisable for worry patients to endeavor to practice a certain sort of a spirit of indifference—not to say carelessness—toward situations and circumstances which have caused them much solicitude, and about which they have worried. It must be apparent to these patients that worry about these situations and circumstances has produced no good results, so why not practice a certain degree of indifference, be in no hurry to take action, and remember that time, which solves many problems, may solve the very problem about which the patient worries now. It would be difficult to fix or to define the degree of indifference which may be advised, and each worry situation and each worry circumstance would have to be judged on its own merits. Of course, there are many situations about which we, as responsible individuals, can not possibly be indifferent, but there are many others toward which a much less solicitous attitude might well be exercised without wrecking the universe or materially shortening anyone's life.

It would be exceedingly well for the patient to form, or endeavor to form a "don't-worry habit," and he will find it to be a splendid form of mental and moral discipline. It will increase his feeling of well being, his poise, his self-reliance, his heroism, his amiability, his dignity, his personal efficiency and his independence. It will make the idle boast of his being "God's masterpiece" mean more to him individually and to the world.

Many influences can contribute to the formation of a "don't-worry habit." One is to cultivate the habit of cheerfulness, which is really part and parcel of the "don't-worry habit." When he is asked how he feels, he should invariably reply, "I am happy, thank you," no matter whether he feels exactly happy or not. He may really feel quite miserable, but he should say he is happy just the same. Certainly it is more commendable to self-hypnotize ourselves into a feeling of happiness and well-being than to hypnotize ourselves into illness. And if a lie is ever justifiable, surely the "white lie" of saying "I am happy" can injure no one; it is not

malicious, affords no food for gossip or scandal, it is easily forgiven, it is heroic sometimes, and may help us more than we can say. Anyway, few people care to listen to our troubles, even though they may make the conventional inquiry, "How are you this fine morning?" The only proper reply is, "I am happy, thank you." If we will laugh, look happy, say we are happy, and try to feel happy, we are much more apt to be happy. "Laugh and the world laughs with you. Weep and you weep alone."

There are many practical business principles which anyone might adopt if he would rid himself of fear and worry about business matters or avoid their causes, such, for example, as doing things on time, or doing them *now*, and never procrastinating; seldom or never taking one's work home, but dismissing all thought of one's work, occupation, or consciousness of business when he closes his desk or workshop at night; always living within one's income and always saving something for the inevitable "rainy day"; never indorsing or signing another man's note or financial obligation; never contracting debts unless absolutely necessary or unless one is reasonably certain that he can liquidate them promptly when due. The investment of money in "wildcat" oil or mining stocks, either purchased outright or on a slender margin, is another fertile source of fear and worry, as is also "marrying in haste and repenting [worrying] at leisure."

These principles of business wisdom need little, if any, explanation, and their observance can avoid many causes of fear and worry. For example, if an individual will refrain from contracting debts and will always pay his bills on time, he will have no creditors to fear and no debts about which to worry. Moreover, he will have no interest to pay; and if he waits until he can pay for what he desires he can frequently get a discount for cash. He will sleep better and his mind will be free to think of other things. With the possible exception of purchasing a home, and thereby avoiding the payment of high or extortionate rents, the purchase of things desired on the "installment plan" is usually poor business policy. Pay day is certain to come some day, and one will usually have much less occasion for worry if he denies himself—goes without the object desired—and waits until he has sufficient means to pay cash for what he desires. The same is true about doing things on time or doing them "now." Not only is work better done if done on time, but with its completion we can dismiss it from our minds—do not have to worry about it—and we are free to take up other tasks or devote our minds to other things. If one will go into the offices of so-called "great men" or "captains of industry," he will usually find that they have clean desks before them, and it is almost a fetich

with some of them to "do things *now*." Their example in these and other matters might well be emulated by those who would avoid business cares and worries.

The same or similar principles should be made to apply to one's domestic or home life. As suggested in the "Purinton Course of Practical Efficiency," an individual can hardly expect to attain any large measure of success in life or escape some degree of fear and worry if his home is habitually in disorder, if his meals are improperly cooked or improperly balanced with regard to food values; if he eats in a hurry in order to catch a car or attend some social function, not taking time to fully chew his food; if he keeps late hours; if he sleeps on an uncomfortable bed, perhaps in a bedroom the windows of which are tightly closed all winter for fear of catching cold; if he has no extra clothing or collar buttons; if his clean linen is out of place or lost, or not in condition to wear because not mended on time; if his sleep is disturbed by crying children; if he can not get washed, shaved, and dressed quickly because some one else is occupying the bathroom; if he reads his morning paper while bolting his muddy coffee, burned potatoes, and underdone meat, using his energy to read, think, and talk and leaving little or none for the digestion of his food, perhaps smoking a heavy cigar immediately after breakfast; and if, finally, when he starts on a run for the car which will take him to his office or work he is loaded down with a lot of foolish errands and messenger-boy jobs for his wife downtown.

The man who would escape all these fertile causes of fear and worry will, as the "Purinton course" suggests, manage to live away from the congested-traffic zone and he will contrive to find some relaxation and rest on his way home; he will take 10 or 15 minutes on arriving home to change his business clothes and business consciousness before dinner; he will have his dining room the cheeriest place in his home; his dinner will be a model from a dietetic standpoint, and will be both tastily cooked and attractively served; he will find so much pleasure in various home comforts that he will not have to rush away to enjoy himself at night; he will go early to bed and rise with the lark; he will keep one window of his bedroom open all winter, with a proper ventilating device to prevent drafts of cold air; he will have a comfortable bed in which to sleep; he will properly discipline his children so that there will be no, or a minimum of, interference from them during the night; he will have extra collar buttons and abundant mended clothing items on hand for emergency use; his breakfast will be light and nourishing, easily prepared, and quickly digested; he will eat in a calm, leisurely fashion, taking plenty of time to chew his food, and concentrating his attention on eating and enjoying his food; he will provide for

his wife a modern system of delegating small jobs and downtown errands to other people, and he will radiate a spirit of optimism, magnetism, and enthusiasm which will brighten up everybody near him; he will operate a household budget system approved by his wife, and in this way avoid getting scolded for being stingy.

An annual two to four weeks' vacation in the open air, by the sea-shore, in the mountains, in the woods, camping out, automobiling, fishing, hunting, with congenial companions, is believed to be of inestimable value in toning up one's physical make-up, giving him health, relaxation, courage, independence, and cheerfulness and banishing fears and worries which otherwise would be certain to obtrude themselves into his consciousness. These vacations, repeated each year under proper conditions, give us a wider view of life, unconsciously teach us calmness, deliberation, and give us something new—something different from our everyday fears and worries—to think about, and they seem to lessen the number and size of the problems about which we have worried and which prior to the vacation had seemed so colossal in size and unsolvable.

From the nature of some people's work and their circumstances and surroundings it is often quite impossible to take an annual vacation, or even any vacation at all, while others only imagine they can not take a vacation, or that they are indispensable and can not be spared from their work. As a matter of fact, an annual vacation is an excellent investment, though its actual dollars and cents value can not be directly estimated. It should be remembered that the law of compensation is just as exacting and just as inexorable with the human machine as it is with any other machine, and that man who continues to run his human machine without the vacation time of overhaul and repair will just as surely shorten the life and efficiency of that human machine as though he ran his automobile indefinitely, without paying due attention to oiling the parts where friction occurs and without renewing wornout parts. That individual who can not afford vacations is shortening his life, is increasing the number and degrees of his fears and worries, and is sowing the seeds of invalidism and nervous breakdown. Eventually he will be compelled to find time to be sick, though now he can not find time for pleasant annual vacations, periods of relaxation, rest, and recuperation. There is a limit to human endurance; and while some of us are stronger than others, and therefore can endure more for a longer period than others, no man can run his human machine in high gear and at top speed indefinitely. If he attempts it, he will pay for it in decreased efficiency, in fear and worry, in illness and discomfort, and in a shortening of his life.

The cultivation of a hobby—something in which we can become intensely interested without effort, an avocation—will do much to pro-

mote the formation of a "don't-worry habit." A hobby places one in a new world, affords us a wholesome change of thought from the hum-drum routine of everyday life, acts as a safety valve for pent-up emotions, and enables us to forget, for a time at least, worries and troubles which would otherwise crowd themselves as unwelcome guests into our consciousness. The hobby in itself may be as unprofitable as throwing stones at a mark, but so long as it interests us, and affords us pleasure, it will serve to accomplish the good objects just mentioned, and as such is invaluable, "more precious than rubies and fine gold."

One who would reduce his fears and worries to a minimum should endeavor to maintain as good a state of general health as possible, keep the emunctories open, live in cheerful and hygienic surroundings, choose cheerful companions, and avoid misanthropes and "glooms"; eschew the use of alcoholic liquors, drugs, and other so-called "stimulants"; avoid extended arguments, especially those of an offensive nature; avoid late hours; secure an abundance of exercise, preferably in the open air; wear well-fitting, nonrestrictive, and comfortable clothing; and secure an abundance of sleep and easily digested nutritious food. In this way he will in a measure be as effectively armed as he can be for the troubles and trials he will encounter during his waking hours and which have in the past caused him to be fearful and to worry. That individual who has armed himself is much more confident of his ability to cope with adverse conditions than the individual who has no defense and when he is confident his fears and worries are either absent or diminished in degree. The man who is prepared, who is armed, feels that he has a fighting chance, and is inspired with a courage which is lacking in the man who is weak and feels that he is weak, who is ill, who has kept late hours and had insufficient sleep, whose tissues are whisky or drug soaked, who, in short, is unarmed and unprepared. Even insignificant and inferior armament, such as a small stick or club, will sometimes give a man courage to attack a wild animal which he would be afraid to attack when armed with nothing but his bare hands.

Lastly, an effort should be made to train the will of the patient harassed by fears and worries. This will take a long time and had best be begun in childhood. According to White and Jelliffe in their *Modern Treatment of Nervous and Mental Diseases*—

"the most effective training of the will lies in securing the right sort of attention. The person who lives in the moment can never really will. The development of the ability to hold relatively remote ends of action in consciousness is the very foundation of will training. This ability must be acquired as soon as possible in the child. He

must be taught to see ahead; he must be made to turn from the allurements of the moment and consider the consequences of his acts. Deliberation is a quality of mind that has been slowly acquired by the race. It has grown up under the harsh tutelage of experience; the disastrous results of rash decision have induced caution; the fear of consequences has inhibited hasty action. What affects the behavior of the race has a consequence for the individual. The normal individual takes a lesson from unpleasant consequences and acts with greater caution. * * *

"In educating the will of the individual it should be seen that as far as possible he is freed from irrational fears. There are many of these that resemble true phobias. Such are the fear of the dark and the supernatural, the belief in certain taboos and unlucky signs. Education can do much to relieve the mind from these. Extreme suggestibility, which is characteristic of the undeveloped and of the feeble-minded, should be eliminated as far as possible and the individual trained to act on his own initiative. * * * Independence of action, ability to direct oneself in the affairs of life, is a strong indication, if not absolute evidence, that the individual is normal. Thus it is that by securing the proper variety of attention, by inculcating due caution, by banishing useless fears, and by obtaining at least a modicum of initiative and independence the individual's will can to a degree be educated. It should be remembered, however, that there is no will training in the proper sense of developing an all-around faculty of deliberation and choice. The ability to exercise voluntary choice is many sided. It can be developed in relation only to certain situations, namely, those that come under the ordinary experience of the person. No one can be trained to will in general, so to speak. * * *

"The 'strong-willed' man does not act impulsively, and yet is capable of decision when it is required. He can see various phases of the situation, but they do not so confuse him that he can not hold the essential aspects firmly in his attention. He is cautious to the requisite degree, but is possessed by no undue fear. He takes the advice of others, but can act independently when it is necessary. He is not swayed by popular whims, and while in touch with the spirit of his age and generation, he has broad enough vision not to be completely dominated by its prejudices."

The writer knows of no effective prophylactic measures against fear and worry other than those mentioned above. Anything which will promote the health and happiness of an individual may be regarded as a prophylactic measure. Education can do much along this line. In the course of time eugenics might produce a sturdier and braver race, which would be less given to useless worry, but as

yet this is a very far-off event and will necessitate the coordinated efforts of many minds. At present there is much opposition to the eugenics idea.

Drugs have little or no place in the treatment of fear and worry. It is frequently found that these patients, who are so commonly neurotic, have been taking great quantities of narcotic drugs and alcoholic liquors, and by far too many of the drug addicts to be found in this country to-day began their downward career in the taking of "dope" to drown some sorrow, kill some fear, or forget some worry. Some of them have accomplished their purpose, at least so long as the effects of the drug continued, but the "cure," if such it could be called, is many times worse than the disease, and the previously free man or woman has placed upon himself or herself the shackles and chains of the drug slave.

It is felt that enough has been written to show the malign influences of fear and worry, and the methods which may be adopted to combat them. When shall our treatment begin? Shall we wait until the "worry habit" is fully formed, until the patient is ill, perhaps incurably so; until his morale is completely broken, until he is a "nervous wreck," until he is insane, until he has committed suicide or some crime, until he has become a drug habitue, or shall we begin our treatment *now*? Can there be any question that we should "do it now?"

Ever bearing in mind the tremendous importance of the hereditary factor in cases of this sort, we should begin our treatment as soon as possible, even with the unborn child. The best and most effective treatment, of course, would have begun with the grandparents of our patients, but since this is now impossible, we should remember that our present patients are the potential grandparents of children and patients yet to be, and while we are improving in greater or less degree the morale of the patients with whom we are directly dealing, our best work will be reflected in their posterity. Thus and thus only will the race be built up. Certainly, this will take a long time, and radical or marked immediate results may not be apparent, but "Rome was not built in a day," and no enduring work worth while is accomplished in a short period of time. Our present degree of education was only acquired after a lifetime of effort, and will continue as long as we live, or until the enfeeblement of age makes the acquisition of new facts no longer possible. If "our feverish work and worry" is to have any great importance, or to occupy any considerable "space in the mighty epic of mankind," it will necessarily have to be of such a nature as favorably to influence generations yet unborn.

Immediate and striking results in the effect of treatment of fear and worry can not and must not be expected by the worry patient,

and this fact should be explained to him by his physician. Hereditary influences and the habits of years can not be completely changed in a few days, and it is impossible to treat fear and worry like an infectious disease, such as diphtheria. The treatment partakes more of the nature of a reeducation of the patient, and is more a sort of evolutionary process of mind development than one of therapeutics and physical development. These latter factors enter but little into the element of treatment of these two evils. The patient must be made to understand that he must in very truth become "the captain of his soul," as Henle expresses it; that he himself is largely the architect of his own health fortune, and that all his physician—all that anyone—can do is to direct him along the correct route, and, in a measure, to sign-post his way.

"I sent my soul through the Invisible
Some letter of that After-Life to spell:
And bye and bye my soul return'd to me,
And answer'd, 'I myself am Heav'n and Hell.'"

PSYCHOANALYTIC LITERATURE.

By J. C. THOMPSON, Commander, Medical Corps, United States Navy.

There are a great many medical officers in the Navy who desire to acquire a much more thorough training in one of the specialties than their routine college course was able to offer, or for which there was time in the curriculum of the Naval Medical School.

When these seekers turn for further knowledge to the field of bacteriology, hygiene, or eye and ear, for example, there is no difficulty in promptly becoming acquainted with what is the best literature on the subject. They have but to consult one of the standard textbooks so generously supplied to them by the department and there will be found references ample for many months of study.

In the province of psychoanalysis, owing to its being the most recent theoretical and practical contribution to the art of healing the sick, the bibliography seems to be curiously secreted from general accessibility. This at times is due to the lack of precision with which the word is used, especially in the book shops; its etymology is looked up by the junior clerks, "soul analysis" accepted as its meaning, and thereupon psychoanalytic material is placed on the same shelf with every conceivable variety of book, some dealing with the strangest of human emotions.

The term "psychoanalysis" in medicine applies strictly to the discovery made by Freud of the technic employed in studying and curing certain nervous diseases. These are the psychoneuroses.

They are classified as the true neuroses, such as hysteria, compulsion neurosis, the obsessions, anxiety hysteria, and the phobias; also as the actual or somatic neuroses, such as neurasthenia and anxiety neurosis.

The field of application of psychoanalytic therapy has been vastly expanded by the American school, so as now to include the return to a certain degree of social usefulness and even unto the complete repair of some of the severe psychoses. The leaders in psychoanalysis in this country are White, Kempf, Brill, and Jelliffe.

Psychoanalysis deals purely with the unconscious motivation (cause) of human behavior.

Man has two fundamental instincts—one for self-preservation and the other for race propagation. The most important emotion of the self-preservation urge is hunger. The sole emotion of the race-propagation urge is libido. Libido is the energy which gives rise to the entire gamut of human activities.

The character and personality of the individual depends upon the manner in which he acquires energy, converts it into libido, and releases it in procreation, in socially useful creations, in developing and maintaining a neurosis, or in perversions and crime.

The person who is happily married, raising a family, handling his economic situation with success and who has the time and strength to spare for cultural (intellectual) improvement, is utilizing his libido in accordance with the highest psychoanalytic principles.

Those who on the other hand are physically sound but who are failing to measure up to the Freudian standards of fertility, efficiency, and happiness (Kempf) are in trouble due entirely to a faulty expenditure of their libidinous energy. The dictum of Freud on this subject is inexorable: "In a normal *vita sexualis* no neurosis is possible."

Libido manifests itself in a perplexingly varied range of activities. Constructively it is the power from which springs the most brilliant enterprises of man, in science, engineering, literature, and the arts. Destructively, when misunderstood and mishandled, it is the cause of all the neurotic symptoms such as fatigue, irritability, insomnia, the psychoneuroses such as anxiety, morbid fears, hysteria, and neurasthenia. Finally to it may be attributed the true insanities, the perversions, and no end of criminal acts.

Psychoanalysis is the technic of discovering the hidden unconscious motive for behavior or conduct which is deleterious to the health and happiness of the individual.

When the analyst has uncovered the unconscious motive for a certain neurotic symptom and this motive is understood by the

patient the symptom regularly disappears. This uncovering of the hidden motive does not consist in the mere explaining to the patient the mechanism of his plight. The understanding alone comes from the analytic technic of free association and subsequent rational synthesis.

At the present time there is no general textbook on psychoanalysis. The most accessible volume to the naval medical officer is the last edition of *Diseases of the Nervous System*, by Jelliffe and White. The chapter on the psychoneuroses is one that, if read and at all times held clearly in mind, would prove to be a rarely valuable accession to one's diagnostic acumen.

From this the student would do well to go over a half dozen or so of the titles listed under the heading of general literature. To stress any of them in particular would almost be unwarranted. Every one of the books will amply repay the reader. To begin with, it might be best to choose *Psychoanalysis; Its History, Theory, and Practice*, by the late André Tridon.

The student who intends becoming well versed in the art had then better turn to *Psychoanalysis*, by Brill, and to *The Technique of Psychoanalysis*, by Jelliffe. When the contents of these volumes are understood one is then prepared to read the works of Freud, preferably in the following sequence: *Three Contributions to the Theory of Sex*, *A General Introduction to Psychoanalysis*, *Selected Papers on Hysteria and Other Psychoneuroses*, and finally *The Interpretation of Dreams*. It is only fair to state that the latter citation, without any doubt, will require harder study to master than any work of its size in our medical library.

Psychoanalysis relating, as it does, to the study of human behavior is by no means confined to the neuroses. It has the widest application in the critical investigation of the primitive urges that underlie the drama, poetry, art, mythology, folk-lore, and the customs and ceremonial practices of primitive folk. For those who care to approach these subjects from the standpoint of the analyst there are listed few titles under the caption of *literati*.

The medical man confronted with some of the bewildering problems of child culture, such as nocturnal enuresis, obstinacy, food prejudices, stuttering, marked disobedience or falsehood, will find themselves far better able intelligently to advise the parent if some of the psychoanalytic work relating to children is gone over.

The outstanding monograph dealing with this phase is from the pen of Dr. H. Von Hug-Hellmuth. She has made exhaustive observations concerning the latent and awakening sexual activities of children. Knowledge of her writings is essential to an understanding of the endless curious and capricious acts of the child. It is

just exactly these which, if misinterpreted and stupidly handled by the parent, may result in psychic trauma. Unfortunate episodes of this kind occurring in childhood may be directly related to some of the most serious neurotic illnesses in the adult. Above all are these childhood impressions absolutely and unequivocally responsible for endless marital distress.

It is essential that the advanced student early in his career become thoroughly acquainted with the work of Kempf, especially his *Psychopathology*. This is one of the most important and original works on psychic disturbances that has been written by any English-speaking psychologist. It touches upon all types of neurotic symptoms, which range from little personal habits and idiosyncracies at the beginning to the terminal mental dilapidation of the incurable insane. This volume is profusely illustrated from the modern arts, sculpture, and institutional inmates.

Those who seriously take up psychoanalysis as their specialty must make a thorough review of the writings of White, not only those relating to psychopathology, but those which discuss the broader philosophical principles of human behavior.

The advanced student will find a number of invaluable papers published in the *Nervous and Mental Disease Monograph Series*; also in the *Psychoanalytic Review*, a quarterly devoted exclusively to psychoanalysis.

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CHRONIC COLITIS.

By J. B. POLLARD, Lieutenant Commander, Medical Corps, United States Navy.

Chronic Colitis does not usually exist as a definite and separate disease entity, but is so intimately associated with other pathological

or functional disturbances of the alimentary tract that it has to be considered in conjunction with these other conditions in order to be approached from an intelligent and scientific angle. The truth of this statement is well substantiated by the fact that the majority of enterologists consider it advisable to use the term "chronic enterocolitis," rather than the terms "chronic colitis, chronic enteritis," etc. This statement, of course, does not preclude the possibility of the existence of a single condition such as chronic colitis, but is made with the idea of bringing home the fact that a chronic inflammatory process affecting apparently a certain part of the intestinal tract invariably produces reflex or functional disturbances in other portions of the canal, and frequently, owing to continuity of structure, a definite pathological process. Probably the most suitable term to employ in discussing chronic inflammatory disease of the colon is "mucous colitis," as that immediately brings before one the more or less characteristic pathology and at the same time presents to the mind's eye a clinical picture which is unmistakable. The disease has been recognized for several centuries and is known by various synonyms, such as membranous enteritis, tubular diarrhea, mucous colic, and myxoneurosis intestinalis, the latter, in the opinion of the writer, being particularly applicable, inasmuch as the clinical picture shows the passage of large quantities of mucus, with an associated nervous or hysterical tendency. Osler states that the disease has increased tremendously of late years and to such an extent that it has become the fashionable complaint, and even in a large measure has displaced our old friend neuritis in the affections of the neuropaths.

Etiology.—According to Bassler, inflammation of the colon frequently occurs as an accompaniment of general catarrhal inflammation of the bowels, and is a common accompaniment of organic disease of the large bowel, such as carcinoma, stricture, fecal infection, and the like. It is, of course, also met with as a manifestation of specific infections, such as dysentery, sprue, etc.

In considering this condition it is believed that the classification outlined by Daniels and accepted by Bassler lends itself to the proper understanding of the disease better than that of any other workers in this field. The classification is as follows:

1. Primary idiopathic colitis (mucous, mucomembranous, or catarrhal).

2. Secondary or consecutive colitis. (a) Bacterial in origin, (b) protozoan in origin, (c) unclassified origin.

A working classification is based on the character of the discharge.

1. Colitis with mucous discharge.
2. Colitis with all other forms of discharge.

The inference is that the primary idiopathic group is largely of neurological origin, but possibly augmented to some extent by improper diet. In the secondary consecutive groups the vast majority of colitis cases are of bacterial origin, which can be demonstrated by careful stool examination, in which a certain bacteriology is found associated with quite definite pathological changes. For instance, with the bacillus coli group there is usually seen an atonic type of pathology with a flattened and thinned-out mucous membrane and a dry surface. This is the result of an intestinal toxemia of long duration. On the other hand, we have the saccharo-butyric type in which the destruction of the mucous membrane is not so extensive, though, of course, there is at least impairment of the secretory apparatus. Some cases are of the hypertrophic type of pathology and are represented in the fermentative class of intestinal toxemia, due to high anaerobic content of bacteria, most often the putrefactive anaerobes of the *B. aerogenes capsulatus* and gram-positive coccal types. The neurological cases, in which also the element of dietary indiscretion enters, constitute the vast majority of the remaining instances of chronic colitis. These are usually met with in individuals who are poorly nourished, thin, anemic, having low power of endurance, sufferers from neurotic and psychasthenic states, and those of a nervous, excitable, and restless type. It is not the opinion of the writer, however, that these so-called neurological cases are the result of nervous affection per se, but rather that the nervous manifestations are due to some definite pathology which may or may not be situated in the intestinal tract. Certainly we know that there are cases of this type in which we find kinking or obstruction of the colon from adhesions, a pericolitis, dilatation of the colon, visceroptoses, chronic appendices, post-operative adhesions, or other inflammatory processes within the abdominal cavity. In other words, it is believed and felt that the diagnosis of neurasthenia so frequently used serves but to cloak, in 90 per cent of the cases, a definite pathology which may or may not be clinically manifest.

In discussing chronic inflammation of the intestinal tract from the standpoint of symptomatology, diagnosis, treatment, etc., it is deemed expedient to consider it in toto, even though we admit that clinically it is possible to distinguish chronic catarrh of the small intestine, chronic catarrh of the large intestine, and combined or mixed catarrh in which both large and small intestine are diseased simultaneously. Very frequently one finds that chronic enterocolitis is the end result of an acute condition that has not healed properly, due in a large measure to improper treatment. This, however, does not necessarily follow, as some of them persist in spite of most careful and scientific therapy.

Symptomatology.—Aaron very succinctly states that subjective discomforts alone are not sufficient for the diagnosis of chronic intestinal catarrh, as there are such marked variations in these symptoms, owing to the difference in the extent and intensity of the morbid process. Very frequently the subjective symptoms are in a large measure absent or of such insignificance that they make no impression upon the patient, who only becomes aware of his condition by the thin consistency of his stools. On the other hand, however, there may be more or less abdominal distress, though the stools are apparently normal. This, however, is not the picture of the condition as it usually appears, and in the experience of the writer the patient is keenly aware of the fact that an active pathological process is in evidence and the mental anxiety and emotional distress is very intense. The mental attitude, of course, serves to exaggerate the subjective symptoms, and no doubt has a very definite deleterious reflex bearing on the disease process itself. One frequently finds that these patients show quite a marked degree of nervousness, are self-centered, introspective, and worry a great deal about the excessive amount of mucus in their stools.

They are difficult to control, and the protracted course of the disease is responsible for a large percentage of these cases becoming chronic invalids, some of them extending over periods of 10 to 20 years and suffering from frequent recurrent attacks of abdominal cramps, associated with the passage of large quantities of mucus, and sometimes even intestinal casts. The attacks may be paroxysmal in character, associated with colicky pains, and in some instances so severe that an acute abdominal condition such as appendicitis is suspected. Emotional disturbances, worry, or errors in diet may be responsible for an attack. Constipation is a special feature in many cases, while in others diarrhea is present, or the two may alternate. Osler states that while the disease is obstinate and distressing it is rarely fatal, though Herringhaus reported three cases of mucous colitis in which death occurred suddenly, associated with great pain in the left side of the abdomen. The abdomen itself is rarely distended. There is often, however, a very painful spot just between the umbilicus and the left costal border, tender on pressure, and sometimes the paroxysms of pain seem centered in this region. A spastic condition of the colon frequently exists and is easily recognized by palpation.

Diagnosis.—The diagnosis of chronic catarrh of the intestinal tract is practically invariably determined by the nature of the stool. It must be remembered, however, that the discharges in catarrh of the small or large intestine may be either diarrheic or firm and on inspection apparently normal. When the small intestine is chiefly in-

involved diarrhea is the rule and constipation rare, while if the large intestine is the chief sufferer there is an average equal frequency of the two conditions. The presence of mucus in the stools is the pathognomonic sign of catarrh of the colon, but it must not be forgotten that this holds true in similar conditions involving the small intestine. The origin of the mucus can be determined, however, by careful macroscopic, microscopic, and clinical analyses. When the colon is chiefly involved the mucus is evacuated with the feces or it may be demonstrated by a test lavage. It is always composed of large and coarse shreds and is lighter in color and is more transparent in proportion as its origin is farther up the intestine. The higher up the mucus originates the smaller are the individual flakes, and the more uniformly distributed are they found in the feces. In making a diagnosis of chronic catarrh of the intestine, one has to be careful not to confuse the brownish mucus, which originates in the rectum and which is so frequently seen in cases of chronic constipation, with that which has its origin higher up the canal.

In attempting to make a diagnosis it is, of course, essential that a very careful examination of the individual as a whole be made, taking into account and giving due weight to the nervous reflexes, evidence of endocrine disturbances and the general conditions under which the patient lives. These, coupled with an exact and complete bacteriological study of the stools, will go a long way toward definitely establishing the diagnosis. Once this is an accomplished fact, the enterologist then faces his *bête noire*, for it is a well-known fact that this class of patient is most difficult to treat, and a successful issue can only be obtained through the use of great diplomacy, tact, and a full knowledge of therapeutics in its broadest sense. There is no doubt that the medical profession itself is responsible for a goodly number of enterological neuropaths, inasmuch as there is a marked tendency among some of the fraternity to exaggerate their findings in an effort to impress the patients, thus converting a possibly simple case into a serious one through the active development of the neurotic element which may be lying dormant. Too much information is worse than none in so far as the patient's welfare is concerned; this being particularly well exemplified in physicians themselves, who are notoriously the worst patients in the world.

Then, further, irreparable damage may be done by the prolonged use of a nonstimulative diet, thereby decreasing the functions of the organs to such an extent that there is immediate rebellion when an attempt is made to return to the normal diet. There is every reason to believe that Einhorn is absolutely right in stating that a great many patients with dyspeptic symptoms suffer from "sitophobia" and that this dread of food has to be overcome before any progress

can be made in treatment. He also states that it is essential to health that the digestive organs be trained to handle all types of food, including those difficult of digestion as well as the easily digested, as it is only in this way that the normal secretions can be maintained.

The first essential in the successful treatment of chronic enterocolitis, or, for that matter, any other affection of the human race, is confidence of the patient in the physician. Without this one is truly treading upon thin air, while with it he is astride the top of the world, with half the battle won.

The treatment proper is based upon the relief of the attack itself and the removal of the causes of the disease. As we all know, the prime essential in the treatment of any inflammatory condition is rest of the part in so far as it is practicable. This is obtained by putting the patient to bed, with warm applications to the abdomen, careful regulation of the diet, and the administration of such remedies as may be necessary to allay the intestinal irritation. At the beginning of the treatment no mistake can be made in administering castor oil and following this with a saline soap enema, or perhaps a better method is transintestinal lavage, using a hypertonic saline solution. In this way a very quick emptying of the intestinal canal is obtained and at the same time the associated toxemia is decreased. Bromides, to allay nervous irritability, are indicated, but no opiates should be used if it is possible for the patient to get along without them. Nothing should be given by mouth for the first 24 hours, and when the patient begins to take food it should be in the form of a simple normal soft diet of an anticonstipating type, taken three times a day, with nothing between meals. There is no question that diet constitutes at least 90 per cent in the successful treatment of chronic inflammation of the intestinal tract, and the physician who is able to prescribe in detail one that can be assimilated and at the same time supply the necessary calories will undoubtedly meet with the greatest measure of success. Constipation, of course, is the rule in these cases and has to be overcome. This is best obtained through the medium of diet and proper training of the individual rather than through the use of cathartics.

The cases in which there is disturbance of the endocrine system have to be treated along the line of the apparent defect if we are to get results in the other direction.

The neurological group are naturally the most difficult of all to treat, inasmuch as they are usually of a social type that are very difficult to impress with the necessity of carrying out instructions and frequently persist in doing the things which are prohibited. These are the cases that frequent the foreign spas and are greatly

benefited thereby, due to the fact that they follow there a correct regimen of living which they utterly fail to do at home.

In conclusion, it must be borne in mind that any surgical condition associated with chronic inflammation of the intestinal tract should receive appropriate treatment and, if practicable, all foci of infection removed prior to the beginning of the medical treatment. This would, of course, include such conditions as chronic appendices, gallstones, ulcer of the rectum, etc. The psychic effect of the operation is frequently of great benefit to the patient, to say nothing of that derived from removal of the irritative lesions themselves. In some cases where there is a tremendous output of mucus with an irritative diarrhea, colonic irrigations are indicated, and these may be followed by starch enemata to allay the excessive irritability of the lower bowel. Intestinal antiseptics are of very little, if any, value in this condition; and if any are used, phenyl salicylate is the one of choice. Operative treatment is of no value in mucous colitis and should never be advised.

CHOLECYSTITIS OF CHEMICAL ORIGIN IN MAN FOLLOWING INHALATIONS OF POISON GAS.

By H. M. STENHOUSE, Lieutenant Commander, Medical Corps, United States Navy.

In January, 1921, F. C. Mann¹ published the results of his experimental work on the chemical production of cholecystitis in dogs. By the injection of Dakin's solution into the general circulation he was able to produce a definite destructive process in the gall bladder. The reaction was rapid, selective, and severe, which indicates that it was the result of a chemical change in the blood vessels as they traversed the organ. It was stated that the work had been done "not because of the possibility of its having any direct bearing on the condition as it occurs in man, but because it offered an opportunity to observe the production by a chemical of an inflammation of a particular organ."

The purpose of this paper is to show that chlorine inhalations from poison gases used in recent warfare cause the same chemical reaction in the human gall bladder.

Evidence of chemical origin.—Among 1,832 admissions to League Island Hospital² after the wounded had begun to come back there were found 28 histories with symptoms suggestive of gall-bladder disease. Eighteen of this number³ showed that the persons had

¹ F. C. Mann, *Annals of Surgery*, January, 1921, p. 55.

² Case histories 14776 to 16608, League Island Naval Hospital, Philadelphia, Pa.

³ Case histories on which statements are based, Nos. 14776, 14891, 14893, 14907, 14967, 15344, 15439, 15496, 16468, 12109, 12669, 15247, 16200, 15310, 16310. E. M. B., B. G. F., J. MacD., J. J. J.

attached some importance to or connection between their symptoms and their injury by the gas. These were all routine ward histories taken by various physicians and can be regarded at least as an unprejudiced coincidence. The examining physicians were not seeking to corroborate my hypothesis. The notations regarding exposure to gas were manifestly the voluntary statements of the patients.

Certain writers have touched upon the acute sequelæ of gas indicating abdominal complications. Levin⁴ has published a case history illustrating clearly that his patient dated his gall-bladder trouble back to the day he was gassed. Gilchrist⁵ tells of vomiting and epigastric pain coming on within four to eight hours after mustard-gas attacks, appearing "together as a rule, and are apt to be persistent and intractable." Sandall⁶ mentions the "persistence of gastric symptoms" among the late effects of gas. We have found men⁷ suffering from abdominal cramps in cruising submarines where the air is contaminated at times with chlorine gas. Then we knew less about gall-bladder conditions and perhaps did not recognize them. We reported that it probably was due to the "absorption of acid fumes from the batteries with a consequent lowering of the alkalinity of the blood."

We have seen or reviewed carefully four operated cases and five unoperated cases of cholecystitis which resulted from inhalations of poison gas during the war. We base the conclusions reached below chiefly on these nine.

Nature of gas causing symptoms.—It is not possible to determine with any degree of certainty the exact nature of the gases mentioned by the various victims. Five said it was chlorine, two phosgene, and one mustard gas. From a chemical standpoint, however, this is not so important as at first it might seem. Free chlorine gas needs no description. Phosgene has the formula COCl_2 , the resemblance of which to Dakin's solution (NaOCl) is apparent. Mustard gas, dichlorethylsulphid, while a more complex molecule, presents also an available chlorine radical. In these three gases, all of which are involved in this series of cases, we find what Mann considered the active principle in the chemical reaction he describes, available chlorine.

Illustrative case.—Our attention was aroused in this subject by a patient from whom we got the following history. It has been abstracted for the sake of brevity. No. 15247. Age 24. Admitted August 2, 1921. Formerly anthracite miner. Chief complaint:

⁴ A. L. Levin, Southern Medical Journal, March, 1922, Vol. XV, No. 3, p. 175.

⁵ Colonel Gilchrist, War Medicine, Vol. II, No. 5, p. 913.

⁶ T. W. Sandall, Lancet, London, Oct. 21, 1922, No. 5173, p. 856.

⁷ Personal communication to assistant to Bureau of Medicine and Surgery, Navy Department, from Asst. Surg. H. M. Stenhouse, medical officer of K-Boat Submarines, Oct. 3, 1915.

Pains in belly and head. Past history unimportant. Family history: Father died at 55, "miner's asthma"; mother and six brothers living and well. Is married and has two children living, one dead.

Physical examination.—Pulse, 72; systolic blood pressure, 108; diastolic blood pressure, 78 (in bed). Breath sounds distant over both lower lobes. Tactile fremitus increased. Anemic looking and poorly nourished. Heart sounds normal. Abdomen very sensitive and walls thin. Lymphatics enlarged. Reflexes normal. Belches gas frequently during examination. Wassermann negative. Stools negative for hookworm. Sputum negative for tubercle bacilli. Urine normal. Differential blood count shows 50 per cent lymphocytes.

History of present illness.—In October, 1918, was gassed in the Argonne with "chlorine." Had sickness in stomach, nausea, vomiting, dizziness, and pains in the head. After three months in hospitals in France was sent home. Started to work in the mines again. After two days he "went down in a heap." Fainted, felt sick at the stomach, vomited, had pains in belly, head, and back. That was in March, 1919. After various attempts to earn a living as a miner, as a sewing-machine salesman, in a machine shop, and in the mine office he finally came to the end of his resources. He was sent in with a provisional diagnosis of appendicitis, chronic and simple anemia, after a prolonged period of suffering. Feels weak all the time. Has dizziness and pains over eyes and in stomach, sleeplessness at night, belching, and pain under right shoulder. The smell of grease makes him sick and smothers him. Meat and potatoes cause abdominal distress. Complains of a pocket of gas near umbilicus. Vomiting relieves him. Pain not relieved by lying down. Is constipated and has had incontinence of urine. Frequently has night sweats. Once recently vomited blood and has passed bloody, bright red stools.

Preoperative diagnosis: (a) *Tabes mesenterica*, (b) *cholecystitis*. Operation showed distended, discolored, gall bladder with wall thickened. It could not be emptied. The cystic duct was almost obliterated, not permitting any drainage at all.

Clinical features.—Summing up the evidence found in this illustrative case and in the others cited the following features have been deduced:

Onset.—In six cases the beginning of the digestive trouble can be traced directly to the effect of a poison-gas attack. The immediate sequelæ following exposure remind us of the findings of Mann in his experimental surgery. One case gave no history of immediate symptoms, but the acute, typical, gall-bladder attack in a man of his age, with a precise memory of exposure to mustard gas three years previously, suggests that the gall bladder may have been in-

jured at the time. In two cases there was no mention made in the record as to the subjective signs which followed exposure.

Course.—As in cholecystitis from usual causes we found in our patients some who had had periods of comparative or absolute freedom from symptoms but more commonly the victims were chronic complainers and probably truly chronic sufferers. They felt badly early in the day. They were subject to dizziness and headaches. They found it necessary to exercise the greatest caution as to the nature and amount of food eaten. Little indiscretions might precipitate acute attacks of old-time "dyspepsia." Some patients had lost weight while others seemed at least not to have lost any.

Specific features.—(a) Skin: Acne was noted in one-third of the cases. This was in those who seemed well nourished. There was nothing to indicate that this was more significant than it is usually considered in persons of the same age. One patient had scars from mustard-gas burns.

(b) Nervous symptoms: Over half of the records had notations or descriptions of "nervousness." The complaints of this nature included insomnia, irritability, undue excitability, jerky movements of the limbs during sleep, muscular twitchings, incontinence of urine, gagging, and tremors.

Vasomotor weakness is perhaps the most outstanding feature of this so-called "nervousness." There is more commonly than otherwise a low systolic pressure, a relatively high diastolic, and a pulse rate that is faster than it should be. The reflexes were inclined to be hyperactive. One patient complained of dreaming. In no case was there any evidence of a psychosis.

(c) Age: The average age was 27.7 years in nine cases. The youngest was 24; the oldest 39. In the other group 12 of 16 were under 30; 5 were under 25. This number of cases of gall-bladder trouble in young men is not usually expected.

(d) Blood findings: The white count was normal. There was usually a relative increase of the lymphocytes, as has been reported by Miller.⁸ The red count showed in some cases a reduction of cells, but this was not uniformly so.

(e) Pathology: All of the operated cases were of the chronic type. All showed definite pathology of the gall bladder. In three the viscera were otherwise normal. In one there was a concretion of the appendix and macroscopical hepatitis.

The findings in one case described above showed that the gall bladder had been put completely out of business. In the case which showed hepatitis the gall bladder measured 6 centimeters in length and 2.8 in width. The color of the wall was of a yellowish cream

⁸ J. Miller, *Lancet*, London, May 26, 1917, p. 793.

and was dull, lacking the usual luster of a healthy gall bladder. The normal elasticity was lost, so that it was fragile and tore easily during removal. There seemed to be a great deal of fat in the wall. It was limp and had fallen to the right beneath the intestines. Dr. Allen J. Smith, of Pennsylvania, sectioned and examined it and reported;⁹ "Wall of gall bladder of about normal thickness and texture of fibro-muscular portions of wall of ordinary density. The outer coat is rough with fibrous fringe, as if the bladder had been adherent to a neighboring structure. Among many of the lymph clefts there are lines of an excess of lymphocytes in the body of the wall, and frequently in the lumen of injected vessels there is apparent an excess of leucocytes. The occasional glands in the wall are histologically normal.

The mucosa is irregular, with more prominent villous-looking sections of its folds than would be produced by mere functional contraction, and at places seems definitely scarred. Much of the lining epithelium is lost or loosened (partly probably by artifact), that remaining having a normal appearance. In sections stained by Giemsa an unusual number of mast cells are encountered in the sub-epithelial tissue of the mucosa, and there is a slight diffuse excess of lymphocytes in the same layer, but no ulcerative changes appear.

"Sections stained by Gram and Giemsa were examined for the presence of bacteria but none recognized after a moderate search.

"The above features are best explained by a mild chronic catarrhal inflammation, with slight involvement of the deeper tissues, but no suggestion is apparent as to the cause of the process."

Efforts were made in the hospital laboratory at the time to determine the nature of the fatty deposit. Sections stained with osmic acid showed the presence in the gall-bladder wall of some material which took the osmic acid stain as fat does, and it was suspected that this was cholesterol.

Owing to the difficulty of making sections of fat with the microtome and not knowing of any method of identifying cholesterol in the tissues the idea was abandoned. We have recently read of Boyd's¹⁰ new microchemical test for cholesterol in the tissues but have not now any of the material available for study.

Treatment.—The brilliant success which Levin reports from "nonsurgical drainage" as compared with the postoperative notes in our series would make us strongly recommend that the former method be given a trial. There is so much concomitant pathology in some of the cases that removal of the worst offender does not clear up all the symptoms. This is not good for surgery. And be-

⁹ Report No. 7594, Feb. 22, 1922. Univ. of Pennsylvania, Med. Dept., Pathology.

¹⁰ W. Boyd, British Journal of Surgery, Bristol, January, 1923, No. 39, p. 837.

fore any radical surgery is done there should surely be a thorough trial of medicinal treatment. It is suggested that operation be reserved unless the symptoms are so severe that there is a reasonable chance of the operation causing perceptible improvement. Too much benefit should not be promised. Pain should be a prominent feature of the picture. A careful history with physical and special findings should be preserved for future reference.

There has been in these persons a decided disturbance of their chemical equilibrium. Substances such as thyroxin and the products of other endocrines are no doubt circulating in abnormal proportions. There is a profound upset, and from the nature of the picture as a whole it seems as though a return to simple, out-door, active, physical life would do more than any artificial effort to mend things in the milder cases.

CONCLUSIONS.

1. Cholecystitis in man has followed inhalations of poison gases (chlorine, phosgene, and mustard gas).
2. Chlorine either free or combined is the element common to the three gases mentioned.
3. A chemical reaction in the gall-bladder wall is indicated in four operated and five unoperated cases of cholecystitis.

CANCER OF THE STOMACH.

By L. H. WILLIAMS, Lieutenant, Medical Corps, United States Navy.

W. J. Mayo states that more than 30 per cent of all cancers occurring in civilized man is found to be in the stomach and that 30,000 deaths a year in the United States, alone, are caused by cancer of the stomach. This incidence is altogether out of proportion to the occurrence of malignancy in the stomach of animals, though the secretory activity and the food ingested is not essentially different.

The cause of so great an amount of cancer in man and not in animals in the same organ, under not unlike comparative conditions, has been a source of speculation since the time of Hippocrates. Galen believed the concentration of the black bile to be the cause of cancer, a theory which held sway for centuries until refuted by Paracelsus with his doctrine of a local concentration of mineral salts as the exciting cause of the disease.

The essential fundamental factor of cancer formation according to the modern biochemical conception is an abnormal body chemistry; but many and varied processes serve to bring about this abnormality. The acid theory, or belief that acid acts as a stimulus

to growth was first advanced in Germany by Helmont and Ettmuller. That acidity plays an important part, either by irritation or extraction of the minerals of the tissues is a fascinating speculation in view of the fact that so large a percentage of cancer occurs in tissues with an acid-bearing surface.

The life history of the normal body cell is comprised in the processes of growth, function, and degeneration. The malignant cell has only growth and degeneration. It is five times as vulnerable as the normal cell and is treated by the organism as a foreign body by hyalinization and fibrosis. The fibrosis found associated with malignancy is not a part of the growth but is nature's attempt to wall it off and destroy it.

The work of MacCarty, and others, during the past five years has brought the problem of the source, though not the cause of, cancer of the stomach to a practical basis. MacCarty's observations in a study of 507 simple chronic gastric ulcers and 895 carcinomatous ulcers have led to the conclusion that the association of cancer with chronic gastric ulcer is so frequent that the possibility of cancer being present should always be considered. He states there are no clinical or laboratory methods by which the differential clinical diagnosis can be made other than by the microscope; and that experience with chronic gastric ulcers shows that most of those of 2.5 centimeters or greater are cancerous.

Pathology.—The close association of cancer of the stomach with chronic gastric ulcer and the frequency with which carcinoma is found in the border of chronic gastric ulcerations has led the pathologist to a study of the differentiation from normal cells to cancer cells. The stages of differentiation from normal columnar cells of the gastric mucosa to ovoid or spheroid cells, still intra-glandular, to the ovoid or spheroid cells which have broken through the gland wall and are found in the stroma of the mucosa, or in other gastric coats, and sometimes in the base of the ulcer, have been shown by MacCarty in both fresh frozen sections and fixed sections of chronic gastric ulcers. He states the exact starting point of cancer of the stomach is and probably will remain unknown, but the early cancers which have been observed in this organ have been seen in the mucosa and in the borders of chronic ulcers.

The division of gastric cancer into medullary, scirrhus, and colloid types is generally acceptable. Medullary cancer is characterized by soft, cauliflowerlike masses. Scirrhus cancer infiltrates the wall of the stomach and is hard and dense. It gives rise to marked contractions of the stomach. The colloid or mucoid form is related to the scirrhus, but has a gelatinous material instead of dense scirrhus tissue. Hyperplasia and tumefaction are common to all three

varieties, yet ulceration, which is common, plays an important part and considerably alters these characteristics.

The location of the growth is fortunate from a surgical standpoint; 70 per cent are in the pars pylorica, 6 per cent in pars cardia, 24 per cent pars media. The tendency of cancer of the stomach to metastasize to the gastric lymph glands seems to bear no relation to the size (or age) of the growth. Some cancers at operation are found to have metastasized while still very small, yet at least 20 per cent are large enough to cause obstructive symptoms and even cause death without demonstrable glandular involvement. Cancerous involvement may be conveniently graded according to the amount and degree of differentiation of the cancer cells found in the lymph glands affected on a scale of 1 to 4 and prognosis made accordingly.

Symptomatology and differential diagnosis.—At present symptoms definite enough for an early diagnosis of cancer of the stomach, while still clinically benign, are not known, yet beginning loss of weight and appetite, anemia, and weakness, accompanied with pain in a person over 40, with a history of stomach trouble over a long time, should arouse suspicion of malignancy. The age limit is not as important as formerly thought; cancer is found more often in the thirties than is generally believed. All too often the surgeon or roentgenologist is not consulted until obstruction is noted, anemia striking, weakness pronounced, and nutritional changes are present, with nausea, anorexia, and altered blood picture. Hematemesis or melena is found in only about one-third of the cases.

The examination of the gastric contents is of little value. Not until late in the disease, long after the roentgenologists could have discovered malignancy, is the examination of gastric contents significant. Then it reveals abnormal chemistry, retention, if obstruction is present, and occult blood, and often Boas bacilli or sarcinæ. In early cases without obstruction the free hydrochloric acid is usually present and may be found in excess of normal.

The physical examination in early cases will perhaps not show tumor. Tumor can usually be made out sooner or later in the course of the disease. In advanced cases fluid may be present. No unnecessary pressure should be made when examining the abdomen, owing to the possibility of starting hemorrhage or causing perforation in an ulcerating tumor. When the disease is well established the skin is dry and sallow with slight yellowish tinge.

Of late the roentgenologist has usurped first place in the clinical diagnosis of cancer of the stomach. Carman states that 95 per cent of gastric cancers give roentgenologic evidence of their presence; that they can be differentiated with reasonable accuracy from various other lesions within and without the stomach; that their site and

extent can be shown and considerable information obtained as to their operability long before the clinician can arrive at a diagnosis by purely clinical means. The roentgenologist does not attempt to compete with the clinical pathologist in making histologic diagnosis. He can only disclose the presence of a tumor, an ulcer, or lesion of questioned character. Experience has shown that nearly all neoplasms of the stomach are cancerous; that ulcerous lesions of certain types and sizes are most often cancerous.

There are many conditions which may produce apparent filling defects and simulate cancer. They include gas and fecal matter in the colon, secretion in the stomach, spasm, pressure against the spine, extrinsic tumors, ascites, ovarian cysts, and pregnancy. After the history, the Roentgen-ray examination, the exploration and resection of a gastric lesion, the cytobiologist, specializing as a surgical pathologist, is the one man to determine the presence of early cancer in chronic gastric ulcerations or of metastases to neighboring lymph glands. This can be done while the operation is in progress, through the agency of the frozen section and microscope, and the surgeon is enabled to modify his procedure in accordance with the findings.

In a study of 733 chronic gastric ulcerations resected at the Mayo Clinic, differentiation from cancer was unable to be made in 29 per cent save with the aid of the microscope.

MacCarty's rule, that ulcers of 2.5 centimeters or more are cancerous, is a good working rule, for such ulcers are usually found to be cancerous when examined with the microscope.

Treatment.—Cancer of the stomach is essentially a surgical disease. The sooner it is attacked the better for the patient. Radium and X ray are of value only in inoperable cases and after resection, where they can be used to stimulate fibrosis and to hinder the growth of scattered and wandering malignant cells. In cases with obstruction a few days' delay with gastric lavage is of considerable assistance. Lavage clears away any retained debris and allows return of stomach tonus.

If the condition of the patient is poor, regional anaesthesia, supplemented by nitrous oxide and ether when traction is made on viscera, is the method of choice. Inoperability is determined by the amount of glandular involvement, fixation, or location. The most difficult location from a surgical standpoint is in the cardia, the most favorable in the pars pylorica. A gastroenterostomy should be made even in inoperable cases. It removes the obstruction and obviates the dread of death by starvation, besides often prolonging life in comparative comfort for months.

W. J. Mayo states that the operations of choice for operable cancer of the stomach are the Billroth, No. 2, or the Polya.

The Billroth, No. 2, consists of wide resection of the part of the stomach bearing the growth, a sleeve resection, closure of both stomach and resected duodenum, and the making of a posterior gastroenterostomy with the jejunum. The Polya, which has been used by W. J. Mayo since 1914, consists of wide resection of growth, closure, and burying of resected duodenum, and the anastomosis of the resected stomach to the jejunum. The antecolic gastrojejunostomy, W. J. Mayo thinks, is the better.

Conclusions.—(1) Cancer of the stomach is a prevalent disease. Thirty thousand deaths a year are caused by it in the United States. Thirty per cent of all malignancy is cancer of the stomach.

(2) Of 1,159 diagnoses of cancer of the stomach made at the Mayo Clinic (1919–20, C. H. Mayo), 54 per cent were found to be inoperable because of extent of disease, metastasis, complications, etc.; 78 per cent of the diagnoses were on men.

(3) The Roentgen ray has greatly simplified the early recognition of gastric cancer. It should be employed in all cases with a long history of gastric disturbance, especially in persons past 40.

(4) The surgical pathologist, by study of frozen sections of resected chronic gastric ulcerations during the progress of the operation, has greatly advanced the early recognition of gastric cancer and enabled the surgeon to increase the list of three and five year cures.

(5) Cancer of the stomach is the most favorable of all malignancies of the internal organs from the standpoint of successful surgical removal when attacked early. Even in the average operable cases the surgical mortality, according to W. J. Mayo, is less than 10 per cent, while the three and five year cures are steadily on the increase.

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THE PRESENT STATUS OF TREATMENT OF GONORRHEA.¹

By E. A. DAUS, Lieutenant, Medical Corps, United States Navy.

At the outset I wish to say that I have nothing new or original to offer on this subject. My idea in preparing this paper has been

¹ A thesis presented on the completion of a course in urology at the University of California Hospital, San Francisco, Calif.

from a study of the various texts and the literature of the past five years to fix the status of the numerous remedies and procedures used in the treatment of gonorrhea. For convenience I have divided this subject into three parts:

I. Internal remedies, antiseptics (locally used), vaccines, chemotherapy, electrotherapy, and miscellaneous.

II. Plan of treatment: Abortive; acute urethritis—prostatic abscess; chronic urethritis; prostatitis, vesiculitis; epididymitis; strictures; arthritis.

III. Test of cure.

INTERNAL TREATMENT.

Antiseptics, internally, have proven of slight benefit and are now little used. The urine is difficult to make antiseptic in the first place, and as it only comes in contact with the superficial cells of the urethra for a brief period, it can exert but slight influence on the growth of the organisms. Water is forced, to render the urine bland and less irritating, and the diuresis produced keeps the urethra flushed out.

Antiseptics, local.—Many factors influence the use of antiseptics locally. First, the fact that the gonococci are buried in the tissues makes them difficult, if not impossible, to reach; second, body fluids render many antiseptics inert; third, coagulation of albuminous material prevents penetration of others.

Swartz and Davis made an investigation of various antiseptics used in the treatment of gonorrhea with the following results: Silvol, argyrol, and protargol all showed about the same weak germicidal power. Phenol will not kill gonococci in any strength in which it may be used in the urethra in a watery solution. Potassium permanganate kills at 1/2000, while at 1/4000 (the strongest solution possible to use in the urethra) it fails to kill in 20 minutes. Zinc sulphate and boric acid are not germicidal in any strength. Potassium mercuric iodide kills at 1/40000 in 20 minutes, is non-irritating, but has been little used. Chlorozene is lethal to gonococci at 1/32000, but is not used due to its irritating properties.

The organic silver salts, argyrol, protargol, etc., are very widely used. They do not penetrate farther than the superficial cells. Their antiseptic action is probably strong enough to kill organisms on the surface of these cells.

Potassium permanganate is probably the most widely used of any drug in the treatment of gonorrhea, yet it has no antiseptic action in the strength used. It is said to have an affinity for the gonococci and is mildly stimulating to the urethra.

Zinc sulphate is a representative of the class of astringents. They are not antiseptic and are contraindicated in the acute stages due to

their "sealing up" like action. They are of doubtful benefit at any time.

Silver nitrate is the most useful astringent antiseptic, but is best used for instillations or applied locally in strengths of 10 to 50 per cent.

Among the newer remedies we have acriflavine and mercurochrome, 220. Acriflavine, introduced into this country by Davis and Harrel, was recommended for its penetrating and antiseptic powers. Hyman from a review of the literature and a questionnaire, concludes that the results are no more satisfactory than with other drugs. However, he personally thinks it to be one of our best antiseptics used in strength of 1/6,000 to 1/4,000 for irrigation. Its use is sometimes followed by an intractable mucoid discharge.

Mercurochrome is a synthetic compound of fluorescein and mercury, the therapeutic use of which was established by Young, White, and Swartz. They found it to be a powerful antiseptic, nonirritating, and with marked penetrating powers. Practically it has not proven superior to other antiseptics and is objectionable on account of its staining properties. Two new preparations of similar nature, but nonstaining, are being investigated by these men, but no results have yet been published.

Herman Hille, the discoverer of argyrol, has a new preparation of colloidal silver chloride, called lunosol, for which claims of high efficiency are made. It is free from staining qualities. Its germicidal property is due to the emanations given off by the fine particles of silver in colloid form. Cobb, after using it nine months in a large clinic in Chicago, recommends it highly. Ballenger and Elder do not consider the results obtained with it in treatment of gonorrhea as marked, due to the fact that the organisms are protected by the surrounding tissue and pus cells.

In spite of all claims for various drugs, we are far from a specific. Some cases respond to one thing, some to another. No two men get the same results with the same remedies, so it really becomes a question of personal choice. The best we seem able to do is to wash out or kill most of the surface organisms and trust nature to handle the others.

Vaccines and serums.—Vaccines of various kinds have enjoyed a wide reputation. At present their use is limited to chronic cases and complications, and, even in these, is in much dispute. Authorities do not agree that the gonococcus really develops antibodies in the body. Those who believe antibodies are formed maintain that each strain (and there are many) develops its own specific antibody. In addition, secondary invaders soon appear and may even drive out the gonococci entirely, especially in chronic cases. To

overcome these two factors, autogenous vaccines were introduced, but are difficult to make, expensive, and unstable (Lange).

To quote some of the authorities: Geraghty says that gonococcus vaccine or any of its modifications is utterly useless in the treatment of acute or chronic gonorrhea. In most instances in which favorable results have been obtained, acute reactions have followed their use, such as fever and leucocytosis. Culver, in a thorough investigation, found that equal results were obtained by using intravenous injections of killed gonococci, meningococci, or colon bacilli; clinically, benefits run parallel with the fever and hyperleucocytosis. They were of little or no prophylactic value against new complications.

Lee-Brown, Player, and Mathé found no permanent effect produced by autogenous vaccines on a large series of cases of chronic prostatitis.

In England opinions are more favorable. Thomson claims that the poor results of ordinary vaccines are due to the fact that they are too toxic to give in large enough doses to produce sufficient antibodies. He uses a detoxicated vaccine, given in large doses with good results. Lees confirmed these results in a large series of cases. Thomson, however, says that some cases do not react well with vaccines due to causes unknown. Lumb states that the elimination of gonococci from the urethra and its side tracts in several cases proved disappointing.

From other countries come the same conflicting reports. The many kinds of vaccines and the new ones being advocated, as with antiseptics, is a sign of their inefficiency.

The value of antigonococcus serums, phylacogen, etc., has not been proven and they are now rarely used. However, several reports (foreign) have recently been published on the subcutaneous injection of the patient's own serum.

Chemotherapy.—The theory of this method is explained by McDonagh as follows: "Chemotherapy increases the oxidizing and reducing actions of the protein particles accordingly as metals or nonmetals are used, and these two actions are the combating methods employed by the protein molecule to overcome an enemy parasite or poison."

This is the presumed action of salvarsan in the treatment of syphilis.

The substances he uses are: Intramine, an amino compound of sulphur; trimine, colloidal manganese containing iron and zinc; pallamine, colloidal palladium, and colloidal iodine. By the use of these agents he claims to have reduced the time of patients in the hospital from 40 to 18 days. He reports 800 cases with 2 per cent epididymitis, 2 per cent arthritis, and vesiculitis under 1 per cent.

In addition to his chemotherapeutic agents he uses detoxicated vaccines.

Methyl, phenol serum, advocated by Doctor Cano, of Salvador, has been reported on favorably by Valentine, Townsend, and Cano. It is given intravenously and intraprostatically. Favorable reports are also made on its use at the United States Government clinic, San Antonio, Tex.

Various synthetic preparations of mercury were used, especially in the British Expeditionary Force, but were finally dropped. Chemotherapy in the treatment of gonorrhea is comparatively new and quite complicated as at present advocated. Too little work has been done to establish its efficacy.

Electrotherapy.—Ionization was first used by Morton in 1895. The theory is based on the fact that drugs can be driven into the tissues by means of an electric current. Practically when the ions enter the mucous membrane, secondary chemical changes take place and the desired effect is lost. The method requires the introduction of a metal instrument, which is a contraindication to its use in acute cases. The results of this method do not seem to recommend it.

Russ devised a treatment by means of a sound in the urethra through which a galvanic current is passed, on the theory that the gonococci migrate to the positive pole (the sound) and are killed. Other investigators have failed to confirm his good results.

Electrocoagulation, also termed fulguration and diathermy, has almost entirely supplanted the use of the electrocautery. A bipolar or d'Arsonval current is used either for surface action by sparking or penetrating action by electrocoagulation. Its most important indication is in the destruction of occluded diseased glands in the anterior urethra and polyps of the posterior urethra and vesical sphincter.

Miscellaneous.—Various other therapeutic agents have been and are being introduced. Numerous methods of applying heat to the urethra above the lethal point for gonococci have been tried with poor success. Bier's hyperemia does not seem to have come into use, although spoken of highly in acute cases by Miles, of Edinburgh.

PLAN OF TREATMENT.

Abortive treatment.—This treatment must be commenced before the gonococci have penetrated the mucous membrane, i. e., before the third day. Ballenger advocated the method of sealing in the urethra a 5 per cent solution of argyrol. He reports very satisfactory results with this method over a period of 12 years.

Harrison reports the cure of 2,600 cases with this treatment. His technic differs in that he first irrigates with potassium permanganate followed by injection of 10 per cent argyrol retained 20 minutes.

Recently Ballenger has reported the use of lunosol with results superior to argyrol. This method has much to recommend its adoption, especially in the Navy where opportunities are better for getting cases immediately after infection. The important point is not to use drugs of such nature or strength as to damage the urethra. In the event that the attack is not aborted, routine treatment can then be instituted.

Acute urethritis.—The theory has been advanced that the formation of pus following infection with gonococci is a natural reaction of the body and should not be interfered with by any local treatment. To disprove this, Harrison reports a parallel series of cases with and without local treatment, with results much in favor of local treatment. Lumb in 2,774 cases of epididymitis found 66.7 per cent to have developed before receiving regular treatment, while only 33.3 per cent developed after treatment had commenced.

Donald and Davidson treated 200 cases by local and general measures and 200 by general treatment alone and found the combined measures much superior. It is best to institute local treatment as soon as possible.

Much controversy has arisen over the use of injections and irrigations. Objection has been made to injections on the grounds that the patient, being unskilled, is liable to injure the urethra by forceful distention, also that the infection is liable to be forced into the posterior urethra. They are used, however, by many good men, who instruct their patients carefully in their use. Irrigations, urethro-vesical, are used by the majority. The use of urethro-vesical irrigation is based on the idea that pus finds its way into the posterior urethra in some unproven way, perhaps by the massage of urethra by the perineal muscles. It has been found that injected fluids can not be limited to the anterior urethra, so the irrigating fluid is allowed to pass into the bladder and then urinated out by the patient, thus washing out any pus which may have found its way into the posterior urethra. The possibility of carrying the infection back by the irrigation is nil if properly conducted.

Lufs says that the only contraindication to irrigation is when the meatus is markedly inflamed and micturition and erection are horribly painful. However, all local treatment is contraindicated until these symptoms subside. In acute posterior infections the treatment is essentially the same. If the symptoms are hyperacute, and especially if acute prostatitis supervenes, all local treatment should be stopped. Resort should then be had to sedatives, hot sitz baths, and heat applied directly to the prostate by means of the psychrophore.

At this time we might conveniently consider the treatment of prostatic abscess. Lumb attempts to evacuate the pus into the

urethra by pressure of the finger per rectum. Only one trial is made. He has successfully treated cases in this way. Barringer reports good results in the use of an aspirating needle passed into the prostate through the perineum. He thinks the results are not good in cases caused by other organisms than the gonococci. At the Bellevue Clinic an attempt is made to evacuate the abscess into the urethra by manipulation with the point of a small sound in the urethra.

The objection to an intraurethral opening is that it leaves a pocket which tends to remain and keep up a chronic infection. The surgically correct technic is considered to be perineal incision and drainage without opening the urethra.

Chronic urethritis.—It is impossible to say at just what stage gonorrhea ceases to be acute and becomes chronic. What is usually meant is that the disease has lasted longer than usual with shreds in a comparatively clear urine and no symptoms. A slight discharge may be present. It means that the disease has become confined to localized areas, and the indication is to find these areas and treat them. First, an accurate diagnosis is most essential. The urethra is first investigated with a bulbous bougie, for the presence of infiltrations and strictures. The condition of the prostate and seminal vesicles is determined by palpation and microscopical examination of their secretions expressed by massage. The urethroscope is one of the most important instruments in both the diagnosis and treatment of these cases. In this connection, Player and Matté report a series of 68 cases of chronic prostatitis in which they found tumors in the posterior urethra. Seventy-three per cent following removal showed marked improvement and probable cure. The diagnosis and treatment was only made possible with the cystourethroscope. Foreign authorities are most insistent on the use of the urethroscope. Every chronic case is examined, first, for diagnosis; second, following dilatation, to follow results; third, for direct application of antiseptics, instead of instillations; and fourth, to determine cure. Although less used here, emphasis is laid on the fact that all cases resisting ordinary methods of treatment should be urethroscoped. For this reason it is very necessary for anyone treating these cases to become proficient in the use of this instrument.

In the treatment of infiltrated areas, hot irrigations and dilatations are the method of choice. Powell is of the opinion that every case before being discharged should be given a course of dilatations. His idea is that in all cases there is inflammatory infiltration, whether perceptible or not, and dilatation leads to its absorption. Under this treatment stricture formation is lessened. In considering at what stage to dilate, it must be remembered that no instrumentation should be done in the acute stage. Most men wait until the dis-

charge is entirely free of gonococci. However, at times a resistant discharge may be stopped by one or two dilatations, even in the presence of a few gonococci. Dilatation acts as an intraurethral massage, expressing the contents of the small ducts and exercising the urethral tissues. By compression of the prostatic tissue against its inelastic capsule retained secretions are forced out through its ducts.

Prostatitis and vesiculitis.—If the prostate or vesicles are found affected, massage of these organs is resorted to. Progress is determined by frequent examination of the expressed secretion. Belfield contends that the vesicles are frequently attacked within the first month of the infection, due to their anatomical features, which prevent both a natural defense by drainage and effective local treatment. He has devised a method, termed "vas puncture," for directly injecting an antiseptic through the vas into the vesicles. This procedure has not come into routine use, although it is used by many, in those cases which do not respond to more conservative treatment. It seems to be most efficacious in the subacute infections. Following the operation there is always the possibility of occlusion of the vas with resulting sterility.

Cummings and Glenn report favorably on the use of this method in cases not responding to other methods of treatment. The ordinary case, however, responds favorably to massage which empties the contents of the vesicles. Cases in which the openings are occluded resist expression by massage and can not be filled with antiseptics by vas puncture. For these cases the operations of seminal vesiculotomy and vesiculectomy have been introduced. Vesiculectomy is to be preferred as the most surgical procedure (Stokes).

Cunningham reports an extensive series of cases. He considers the subsidence of symptoms and manifestations following the removal of foci as almost miraculous. As far as could be determined no organisms could be isolated in these cases, which is a point against the efficacy of vas puncture.

White and Gradwohl, in an exhaustive study of chronic vesiculitis, consider it a very difficult problem. Their results, neither palliative nor surgical, were altogether successful. They consider that most cases can be cleared up by palliative treatment consisting of massage, urethral dilatation, and posterior instillations.

Doctor Lespinasse sums up the situation when he says, "If we treat the vesicle directly, we must be sure the disease is in the vesicle itself and nowhere else, and the greatest trouble is to diagnose these cases, not to decide what type of treatment is best." He thinks vasotomy indicated in the acute case, and in chronic cases not influenced by this, removal should be done. Schmidt thinks that resulting impotence is always to be considered, although Cunningham says that he has never seen such a case.

Epididymitis.—In an analysis of 50,000 cases of gonorrhea, Lumb found this complication to occur in 5.5 per cent; 52.4 per cent of these developed in the first 14 days, 25 per cent after 28 days. Only 7.4 per cent of the total number were bilateral. Direct extension through the vas is usually the mode of infection, although it may be through the blood stream, due to lowered resistance by trauma. It has been found that although normally the current set up in the vas by the cilia is toward the posterior urethra, this current is reversed by excitation of the verumontanum, prostate or posterior urethra. This would seem to explain the cause of epididymitis following instrumentation and overzealous treatment, and contraindicates their use in acute stages. Powell has advocated the use of atropin suppositories before instrumentation to stop this reverse peristalsis of the vas. It has also been found that fluids injected into the ejaculatory ducts distend the seminal vesicles before passing down the vas, so that, in cases of epididymitis, vesiculitis is probably always present and must be considered in treatment to prevent recurrences.

The treatment of the acute stage is palliative and operative. Palliative treatment consists of rest in bed with support and hot applications to the testicles. After the acute stage subsides, resolution is hastened by the use of a rubber pressure bandage over the affected testicle.

Hagner is the originator of the operative treatment of this condition. For it is justly claimed the immediate relief of symptoms, pain, fever, etc. It is indicated in those cases of abscess formation that do not respond to palliative treatment, and in chronic recurrent cases. As regards subsequent sterility, Cunningham was able to demonstrate the excretion of spermatozoa in four of six cases operated for bilateral infection. Hagner operated on four bilateral cases, following which two had spermatozoa and two were sterile (McKay). In this connection it must be kept in mind that this percentage is no higher than in unoperated bilateral cases.

Asch has recommended the injection of electrargol, an electrically prepared silver colloid, into the epididymis. Luys considers this the best method of treatment, but Lumb says that the use of this method in England does not confirm these favorable reports.

Strictures.—The best treatment of strictures is prophylaxis; that is, gentleness in the use of medications and instruments. For those already formed resort is had to dilatation. Only those strictures are cut which can not be dilated. Forceful tearing of the strictures should not be done. If it is impossible to dilate, internal urethrotomy should be performed on those anterior to the bulb. External urethrotomy is done for those at the bulbo-membranous or in the

membranous urethra. M. Stern has devised a urethroplastic operation for strictures in the bulbo-membranous region which has yielded excellent results.

Arthritis.—Arthritis is best prevented by early and judicious treatment. Once established the treatment is the least satisfactory of any of the complications of gonorrhea. The first and most important step is to locate and clean up all foci of infection. The prostate and vesicles especially should be investigated. In the acute stage, absolute rest and heat to the affected joint give the best results. Following this acute stage, the usual orthopedic procedures should be instituted. It is in these cases that vaccines are advocated by many of the best men, but are used as an adjuvant to standard treatment.

To sum up, the plan of treatment should be along the following lines: Abortive treatment is tried if the case is seen within 72 hours of the beginning of the attack. If this fails or the case is seen too late for this method, irrigations with some mild antiseptic should be given. A catheter is unnecessary for irrigation, as the patient can be taught to fill the bladder, using a blunt urethral tip, with elevation of the irrigator to four or five feet. Although it does not seem to make any appreciable difference what antiseptic is used, preference should be given to potassium permanganate or some mild antiseptic which will at least kill the surface organisms. It must not be forgotten that some cases do not do well with certain drugs, so something else should be tried. Gonococci also seem to become immune to a drug after a certain length of time, so several antiseptics should be alternated in protracted cases.

If the attack is hyperacute no local treatment should be given until the acute symptoms subside. Water should be forced to keep the urethra flushed by the resulting polyuria. The same treatment applies in the case of an acute posterior infection or if a prostatic abscess supervenes. In the latter case recourse should be had to hot sitz baths and heat to the prostate. In case the abscess does not resolve it should be treated as noted previously in this paper.

It would be difficult to map out a routine in chronic cases as treatment should be directed against the specific lesions in each case. Most cases, however, respond to dilatation, prostatic massage, and irrigation. These cases are often refractory and require treatment over long periods. At this point it might be well to say that often cases are overtreated. A period of rest will often cause the disappearance of pus from the prostate or shreds from the urethra when under energetic treatment the case is at a standstill.

Having covered in a brief way the treatment of gonorrhea we will consider the tests of cure.

TEST OF CURE.

To say that a case is not cured is comparatively easy but to say that it is cured is difficult if not impossible. There seems to be even less unanimity of opinion in regard to a cure than in treatment. Various methods are used, among which are:

Examination of urine by smear and culture.

Irrigation of the urethra with 1 per cent silver nitrate or passage of a sound to provoke a discharge which is examined for organisms.

Massage of prostate and vesicles and culture of the expressed secretion.

Large doses of gonococcus vaccine given to provoke a discharge. This is not considered reliable by most observers.

Complement fixation test. This also has proven a disappointment. It is a test of antibodies and so of resistance, not of damage done. Gradwohl says that it has value in a diagnostic way, but is of no value in estimating cures. Finding of the gonococci by any of the above measures is positive evidence of course, but negative findings can not be considered as absolute proof of cure. To carry out all the above procedures would be impractical, so a moderate course should be pursued. The following would seem to be sufficiently rigid:

1. Absence of discharge, especially "morning drop," for at least a week.
2. Clear urine in three glasses (a few fine shreds in the first glass may be present).
3. Prostatic and vesicular secretion free from pus cells.

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THE DIAGNOSIS AND TREATMENT OF BRONCHIAL ASTHMA.

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The study of bronchial asthma during the last six or seven years has added much in respect to the etiology, symptoms, diagnosis, differential diagnosis, prognosis, and the proper course of treatment of this disease. The treatment of this affection is becoming more successful and scientific, as one by one the many causes of the disease are ascertained. Bronchial asthma, from a standpoint of diagnosis and treatment, at the present time is one of the most interesting of diseases. It is widespread and is an affection with multiple causes.

Before one can gain success with treatment he must find the exciting cause in every individual case. Asthma has hundreds of causes, one or a combination of many working to produce the disease; consequently, one can see that in the diagnosis and treatment much labor is required. Every case requires extensive and prolonged study.

In order to bring to light some of the many etiological factors, working alone or in combination to produce the disease, and their avoidance in treatment, a few words may be said in regard to the various types of asthma recognized. The types are influenced by various etiological factors, which must be looked for, and when found, removed, avoided, or treated. In the past asthma was considered as one disease with no subdivisions, but to-day if one is called upon to treat a number of cases it will be found that a subdivision is necessary for a proper understanding of the cases. During recent years asthma has been subdivided into two principal types.

Type No. 1 is considered the true spasmodic or typical bronchial asthma. Its characteristic feature or manifestation is an attack of suffocation. In severe cases respiration is labored and in many

cases marked cyanosis is present. There are scattered rales, musical in character, throughout the chest. This type of asthma is caused by the action of some foreign protein acting upon the vagus nerve, causing stimulation of the constrictor fibers, which results in spasm of the bronchial musculature, or by the peripheral stimulation of the bronchial mucosa by the inhalation of dust, pollen, or various pulverized particles floating in the air, protein in origin, and derived from the plant or animal kingdoms.

That the patient has a susceptibility to asthma is a well-known fact, but it has just recently been ascertained that this susceptibility is an anaphylactic shock due to the absorption of some foreign protein. That the mechanism of bronchial asthma is brought about as above explained is true and proven beyond a doubt by experiments. If the constrictor fibers of the vagus be stimulated, this stimulation of the nerve is followed by the manifestations of spasmodic asthma. Another and a more striking example is the experiment of Sewall. He injected a guinea pig with horse serum. He later instilled horse serum into the nostrils of the same pig, now sensitive to horse serum, and the pig suffered from attacks of asthma.

Therefore sensitization should be considered as the predisposing factor, and the introduction of some foreign protein into the body as the exciting cause of asthma. This sensitization is brought about in the patient by the first dose of foreign protein absorbed, which stimulates antibody formation for that protein. If sufficient time is allowed to elapse to permit this antibody formation, and then a second dose of the same protein is given, the second dose acts as an antigen. The union of the antibody of the first dose and the antigen of the second dose react violently and produce the anaphylactic shock mentioned above. The results of anaphylactic shock in an asthmatic patient are the symptoms of spasmodic asthma.

Type No. 2 is called atypical bronchial asthma, nonsensitive asthma or better, asthmatic bronchitis. It is not a true spasmodic process. Suffocative attacks never occur as in the true spasmodic type of asthma. This type of asthma is usually associated with disease of the respiratory tract, such as acute and chronic bronchitis, acute and chronic coryza, acute and chronic rhinitis, severe and multiple dental abscess, diseased and pus laden tonsils, and acute and chronic suppuration of the nasal accessory sinuses. Any focal infection may cause this type of asthma. It may be associated with walled-off suppurative pleurisy and bronchiectasis. The predisposing cause of this type is the area of focal infection, and the exciting cause is the absorption of toxin from these areas.

In order to diagnose the various types of asthma, one must have a definite and general knowledge of the various causes which are likely

to produce the disease. Asthma is world wide in distribution. It affects females, but generally males are affected, due to their greater exposure to the exciting causes in the performance of various occupations. People of all ages suffer from the disease. It is found in the infant, the child, the young adult, the middle aged, and it is often present in old age. It may appear in any season, or in any climate, if the exciting cause is present. Heredity plays its rôle in the production of the disease by the offspring acquiring a sensitization from the parents to some foreign protein. This, I believe, in the hereditary type or case, is a most important etiological point, and can explain in most cases of asthma and urticaria why certain people are sensitive to various proteins.

The exciting cause of asthma in most cases, especially in the sensitive type, is to be found in a foreign protein of the person's food, in bacterial toxins, pollen, or dust containing organic protein substances, and in animal products, including their sera, excretions, hair, and dandruff, which all furnish a foreign protein to the patient. Any occupation will cause asthma if the exciting cause is present. Millers and bakers often suffer from wheat asthma. Those exposed to flowers and plants, as gardeners and floral workers, may acquire the disease. Hostlers and cattlemen often suffer from animal asthma, due to the inhalation of the dandruff from these sources. Green-coffee workers may have coffee asthma. People working around poultry may have chicken and duck feather asthma. During the spring, summer, and fall, when flowers and weeds are pollenizing, pollen asthma and hay fever are at their height. Any article of diet may be responsible for asthma. This type of the disease may and usually does last throughout the year unless the cause is found and removed or treated. Silk and wool and furs used as articles of dress may furnish a protein which, if absorbed, will cause asthma. Pillows and feather mattresses containing chicken and duck feathers and toys packed with these substances may be the cause.

Every asthmatic presenting himself for treatment should undergo a series of tests to determine his protein sensitivity before he can expect scientific treatment. There are two methods of determining the patient's sensitivity. One is the cutaneous method and the other is the intradermal. These tests are specific in reaction, and when positive determine the sensitive from the nonsensitive asthmatic. The test is identical in principle with the tuberculin test as employed in the diagnosis of tuberculosis, but much more accurate and useful. Food, pollen, vaccines, and animal proteins are used, however, in the place of tuberculin.

Skin tests have been known since 1873, when Blackley noted that the installation of crude pollen into the eyes of hay-fever patients

produced a swelling of the conjunctiva. He later demonstrated that pollen grains rubbed into the scratched skin of such patients produced a local reaction. In 1903, Dunbar proved that the local reaction was not due to the mechanical structure of the pollen grains, since the reaction could be obtained from an alcoholic or saline extract from the pollen. Von Pirquet and Schick noted that the reinjection of horse serum caused edema about the point of injection, if 7 to 10 days were allowed to elapse between the two doses. In 1912 Schloss described skin reactions by the von Pirquet technic to egg white. In 1914 Goodale demonstrated that when a drop of horse serum was placed in a superficial cut in the skin of patients suffering from horse asthma, a local reaction occurred, and also, that if a drop of the same serum was placed on the anterior turbinate, it caused all the symptoms of typical asthma. In the same year Talbot studied infants by testing their skin to egg white, and found that in all cases where egg white caused indigestion there was a violent skin reaction. Walker, of the Peter Bent Brigham Hospital, in 1918 studied 400 cases of asthma and found that 48 per cent gave positive skin reactions, and Sanford, of the Mayo Clinic, obtained positive reactions in 25 per cent of the cases studied. From such reliable reports it can be seen that much information can be gained from skin tests in asthmatic patients.

The cutaneous method is employed by Walker. He considers the intradermal method as too sensitive and delicate. He claims that normal people may react to the test. Other workers prefer the intradermal method as the most trustworthy, and claim that many asthmatics have failed to give the cutaneous reaction, and have given positive reaction to the intradermal method. These patients were relieved from their asthma by being treated with the protein to which the intradermal tests were positive. Walker's technic is recommended for most cases, but if the patient fails to react, the intradermal test should be performed as a check.

If the cutaneous test is used, the morning of the test the patient should wash the forearm with soap and running water to remove as much dirt and grease as is possible. Before the test is made the arm is cleaned with alcohol and ether, without too much friction, and allowed to dry. Undue rubbing of the skin may result in creating an irritable skin and defeat the object of the tests by giving a false or atypical reaction. Needles sterilized over an alcohol burner are preferable. Numerous needles should be used in order not to contaminate the skin with the various proteins that are used in the tests, the same needle never being used twice during the test. Extreme care is necessary to eliminate the possibility of crossed reactions.

Make a number of cuts or scratches one-eighth of an inch in length and 1 inch apart on the flexor surface of the forearm in two rows 1 inch apart. One of these rows is used as a control. Do not draw the blood, as it may coagulate, thus sealing the cut, preventing the absorption of the protein. On the cuts of one row is placed some of the test protein or pollen and a drop of deci-normal sodium hydroxide solution to dissolve and hasten the absorption of the test material which is soluble in a weak alkaline solution. In 30 minutes the protein is washed off and the reaction is noted as compared with the control cuts on which only one-tenth normal sodium hydroxide solution had been placed. If the intradermal test is used, various strength protein solutions are injected between the superficial layers of the skin. The strength of the solutions vary from 1 to 100 to as weak as 1 to 100,000. A typical positive reaction in either case is an urticarial weal, well defined with irregular borders, pale in color, and surrounded with a bright erythematous zone. The size of the reaction is from that of a split pea to that of a 5-cent piece. In animal cases, especially horse-serum cases, a drop of horse serum injected may cause a wide-spreading induration. This appears in from four to six hours after injection and has been characteristic of horse-serum asthmas.

The value of the skin test when they are positive in asthmatic cases is that they usually differentiate true bronchial asthma from atypical asthmatic bronchitis and various other diseases of the respiratory tract. Errors do occur. Some people react to horse serums and proteins and they are not troubled with asthma at all. These people should be considered as potentially asthmatic, or in many cases potential urticarial cases. Neither of these diseases may be present, and under such circumstances the patient should be considered as a possible asthmatic or urticarial person who may develop these diseases at some later date. This is especially true if such patients at some period in their lives absorb or partake of the sensitive protein. Other patients will show atypical reactions to all proteins, which is usually due to too vigorous cleaning of the arm during the test. Care should be taken to prevent the test powder or solution from being blown into the other cuts by some slight wind, as this may contaminate the other cuts and false reaction result. However, in nearly all cases of asthma in which the skin tests are positive to some protein the removal of that protein from the patient will result in the disappearance of his symptoms.

For routine work the following proteins are required:

1. Animal proteins include horse serum, horse hair, and horse dandruff, along with the hair from the dog, cat, and rabbit, and chicken and duck feathers.

2. Pollen proteins include timothy, red top, pig weed, ragweed, and for the vicinity of San Diego, Calif., acacia, tarweed, and Bermuda grass.

3. Bacterial proteins are the vaccines of the staphylococcus pyogenes aureus and albus, the streptococcus hemolyticus and viridans, the pneumococcus type 1 and 4, and the diphtheroid bacillus.

4. Foods proteins include milk, egg, cereals, various meats, chicken, duck, crabs, fish, shrimp, lobster, oysters, and clams, along with all the various vegetables.

As a diagnostic and etiological factor it is noteworthy that patients sensitive to proteins may have asthma throughout the year due to food, animal, or bacterial proteins. The reason for this is that the patient is constantly associated with and is in contact with the exciting cause of his asthma. Seasonal asthma, however, is due to pollen inhalation, and occurs only during the pollen season or for a short period after pollination is completed. Of cases studied 16 to 20 per cent have reacted to animal protein, either to serum, hair, or dandruff, or to a combination of these. The horse and rabbit are the most frequent cause, the dog and cat next, and wool and feathers appear to be the least frequent agent. Twelve to fifteen per cent of asthmatics will react to food proteins. Ten per cent will react to bacterial toxins or vaccines and about the same number will react to various pollens. Eighty per cent of sensitive cases beginning in childhood are due to food, because new articles of food are being added to the child's diet at irregular intervals. Fifty per cent of the asthmas beginning in adult life will be due to food proteins; that is, the sensitive asthmatic. Twenty per cent of the asthma due to animal protein are in patients sensitized before the age of 2 years. There are practically no cases of sensitive asthma after the age of 50, and this is probably due to the fact that sensitive asthmatics may cure themselves unknowingly by this age by repeatedly eating the causative protein at various intervals and a natural immunity results and cure is effected. This seems to explain why a patient will suffer from asthma for years, and then at some future day he will be entirely free from asthma.

The treatment of asthma consists of finding the exciting cause and removing it, or, if this is impractical, treating the causative agent in order to make it not harmful for the patient. After the cause is found the prophylactic treatment consists of avoiding the same if possible. The pet dog, cat, or rabbit, if causative, are to be avoided by the patient. Desensitization in these cases is dangerous and should not be attempted, especially in children, when it is so easy to remove the cause.

During the acute attack of spasmodic asthma, the patient is in much distress and should receive any line of treatment that will

make him comfortable. In many cases all that is required is adrenalin in 2 to 10 minim doses given hypodermically. Other cases, and those that do not react to adrenalin, will require morphia and atropin, which will place the patient at rest almost immediately. The dose of adrenalin as employed in the treatment of asthma varies in amount. The preparation used must be fresh and not over a few months old. If a fresh preparation is used as small a dose as 2 minims will be effective. Adrenalin which is old and inactive is of very little value in any dose. Good adrenalin will give the patient a shaky sensation, cause dizziness and cardiac palpitation for a few minutes. These symptoms, along with the symptoms of asthma, disappear, and the patient will become comfortable. One dose a day may be all that is required to relieve the attack, while in other cases it must be repeated every four or five hours if results are to be expected.

Between the attacks in the nonsensitive case, potassium iodide in increasing doses is useful. It prevents attacks by liquefying the tenacious bronchial secretions, and thus renders the expulsion of the secretion easier. The patient may be carried on the iodide treatment for months without ill effects. The skin should be watched for acne eruption; and if it should appear, the drug should be discontinued for a short period, with reestablishment at a later date. The iodide treatment is of use especially in the nonsensitive case.

Given an asthmatic patient, some time will be required before the cause can be found. In the nonsensitive case the cause may never be ascertained. In the sensitive patient, during the search for the offending protein the patient should remain upon his ordinary diet until the cause is found. It is not considered safe to place the patient upon a one-article diet, as milk, etc., while search is being made for the causative factor. By so doing the patient may be rendered sensitive to additional proteins, and if this should happen his asthma will become aggravated. I have seen this occur in a case of angioneurotic edema. The patient was kept on a bread-and-potato diet for a period of six weeks before being admitted to this hospital. Upon admission he was found sensitive to a number of proteins, including the common articles of diet. The edema was severe. The lips were swollen and could not be moved. The eyes were swollen shut on numerous occasions, and the fingers and hands would swell to an enormous size when the patient tried to eat various articles of diet. He was treated by feeding on very small amounts of the proteins to which he was sensitive and after four months regained his nonsensitive equilibrium for most foods. At present he suffers from mild attacks of urticaria, and this is due to bread and potato.

It is well to remember that asthmatics, as a rule, are heavy eaters, and that by overeating they often take in an excess of the causative

article of food. The diet at all times should consist of a great variety of food, and a small portion of each should be eaten. The heavy meals should be in the morning and at lunch time, with little or no food for dinner. By eating lightly at night many severe attacks of asthma can be prevented. The bowels should be moved daily to overcome any autointoxication that may be present, and a warm bath at bedtime may prove of benefit, as many patients are more or less neurotic, and this acts as a sedative to the nervous system.

The specific treatment of asthma is the most successful of all treatments. It consists of desensitization of the patient to the proteins with which he is found sensitive by the skin tests, or the entire omission of the protein from his diet, which is called the deprivation treatment. In the deprivation treatment, if the patient is found sensitive to but one or two articles of food and they are seldom eaten, these can be given up and not used by the patient without much inconvenience, and his asthma will disappear and not return unless he takes the protein at some later date. The one difficulty with the deprivation treatment is that the patient may absorb the causative protein at some later date without his knowing it. This is especially true if he is sensitive to egg and milk, for these articles are usually found as ingredients in cake, pie, and some forms of milk bread. Under such circumstances asthma will reoccur.

Desensitization may be brought about slowly by ingestion of small amounts of the offending protein. It must be taken in small amounts daily, as, for example, egg cases are to take small capsules containing egg daily, and slowly and gradually the number of capsules are to be increased in number, thus increasing the patient's egg tolerance. A long time may be required to render a patient immune by this method, and a year may pass before the patient is able to eat a whole egg without trouble. Once desensitized, the patient must partake of the offending protein daily to maintain his acquired tolerance. Once desensitized the skin tests become negative. If the patient becomes resensitized the skin tests will become positive again.

If the patient is found sensitive to one or more of the common articles of diet, he should be desensitized with the subcutaneous injection of the offending protein. In these cases, while desensitization is going on the food should be thoroughly cooked. Food well cooked seems to lose some of its offending action, and this is probably due to the fact that cooking destroys the action of the foreign protein. Patients sensitive to potato can often eat a baked potato when a boiled one will cause trouble. Those sensitive to milk can drink boiled milk when raw milk will cause asthma. Butter and cream can be eaten in milk asthma, as cream contains very little

milk protein and in insufficient amounts to cause trouble. Those sensitive to cereal and wheat can eat toasted cereals and bread without inconvenience.

The solutions of proteins, including food, animals, and pollens, are made up into varying strengths, 1 to 100, 1 to 1,000, 1 to 10,000, and 1 to 100,000. That is, 1 part of the material to 100 parts of decinormal sodium hydroxide solution, and so on. They are sterilized and 1 per cent of phenol is added as a preservative. Dandruff proteins from animals are made up in the same fashion, but are sterilized by fractional sterilization to kill any spores that may be present. All solutions should be tested by culture methods before being used for injections.

The first dose consists of one-tenth of a cubic centimeter of the strongest solution that fails to give a positive reaction, and each week the dose is slowly and gradually increased until 1 cubic centimeter is given. Then the next strongest solution is given in one-tenth-cubic centimeter doses, and so on until the skin tests become negative. At this time the patient is desensitized. Horse and cattle cases are treated in the same fashion. Pollen cases are treated just prior to the pollen season in the same manner as food and animal cases. Bacterial cases are treated with autogenous vaccines. The first dose is 2,000,000,000, and the following doses are slowly and gradually increased in size. If the vaccine treatment is to be of any value the patient should show improvement or apparent cure in 15 to 20 doses. The vaccines are made from any area of focal infection, and especially from the sputum. In bacterial cases surgical removal of the area of infection combined with vaccine treatment may hasten results. Abscessed teeth and infected tonsils are to be removed. Recovery may follow the operation alone if the tonsils are the cause of the asthma. It is often noted that the small and submerged tonsils will cause more trouble than the large boggy tonsils. This is probably due to the fact that submerged tonsils drain very poorly into the throat and cause retention of toxins, which are more readily absorbed than is possible in the case of the boggy tonsils with wide-mouthed crypts. However, both types of tonsils should be removed as a routine in asthma cases. Their removal renders respiration less difficult to these patients. Operations upon pollen and food and animal cases will not improve the case, as the exciting cause can not be removed. It is only of value in those cases due to bacterial infection.

The same may be said of climate. Climatic treatment is of little or no value in sensitive cases unless the climate is free from the exciting cause. Much money can be saved the patient, and long and tiresome journeys prevented, and the proper course of treatment

instituted at the patient's home without great expense. In the debilitated the specific treatment combined with a tonic treatment is of value in bringing the patient's strength to par.

In the nonsensitive asthmatic the home should be as free from dust as is possible. Curtains, which catch dust, should be removed; the floors should be oiled to belay the dust; no carpets should be upon the floors. Coal stoves and oil stoves of the Perfection oil-stove type should not be used, as they furnish carbon particles to the atmosphere, use up the oxygen of the room, and vitiate the air. A dusty atmosphere may prolong any type of asthma after the exciting cause is removed. The patient should dwell away from parks with pollinating plants; the lawns should likewise be free from pollen plants, and the house in which he lives should be located on a paved street in preference to a dusty unpaved road. In the nonsensitive the peptone treatment should be tried, as it has relieved many cases and cured some. It is made of Fairchild's peptone. A 5 per cent sterilized solution is used. One-half cubic centimeter is the first dose, and the dose is increased each week one-half cubic centimeter until $2\frac{1}{2}$ cubic centimeters are given, when a 10 per cent solution is employed in the same size doses. If results are to be derived from the peptone treatment, the patient should show improvement after five or six doses. It is given intramuscularly.

At the present date there are six cases of asthma undergoing treatment at this hospital. There are four cases sensitive to horse serum. Two of these cases are also sensitive to horse dandruff. One of these has been under treatment for five weeks with a subsidence of all subjective symptoms. Only a few râles that cause the patient no inconvenience remain in the chest. This patient has suffered from asthma for the past two and one-half years and will require more treatment. The other has been under treatment one week with slight improvement, and two horse-serum cases are just beginning treatment. There are two nonsensitive cases beginning the peptone treatment.

So far, the treatment of asthma as outlined above has been very encouraging and further research work is to be done in this line during the coming months. It is hoped that the further study of bronchial asthma will ascertain more and more etiological factors causing this disease.

In closing this paper, the writer wishes to state that asthma has many causes, and that to gain results requires much labor, and one should never give an asthmatic up as incurable until he has studied the case from many standpoints as to the possibility of the exciting cause.

THE DIAGNOSIS AND TREATMENT OF FRACTURES OF THE LEG.¹

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In this paper on the diagnosis and treatment of fractures of the bones of the leg we will consider breaks of the long bones, the tibia and fibula, which constitute probably 16 per cent of all fractures. Since January 1, 1922, they have made up about 22 per cent of the fractures treated in this hospital.

These two bones are subject to almost any type of fracture sustained by other long bones. The most frequent site of fracture is near the junction of the middle and lower thirds of the shaft and when both bones are broken the fibula is usually broken at a point higher than the break in the tibia. Infancy and childhood are almost free from fractures of these bones, their occurrence coming for the most part in equal numbers between the ages of 30 and 60 years.

A full discussion of fractures in general, with definitions and classifications, will not be necessary, for they are familiar to all of us. However, a brief review of a few points may be well at this time.

The etiology of fractures of the tibia and fibula is the same as that of fractures of other bones; namely, predisposing and immediate or determining. Of the predisposing causes we have the external, which are incidental to occupation and mode of life and lend themselves to exposure to determining causes. These account for the fact that fractures are more often sustained by males than females between youth and old age. Other predisposing causes are the physiological, such as interstitial atrophy or inherited liability, and the pathological, which are responsible for the so-called spontaneous fractures occurring in disease of nerve centers, rickets, syphilis, malignancy, cystic conditions, and osteomyelitis.

Of immediate or determining causes there are two kinds, those due to external violence and those due to muscular action. Those due to external violence may be divided into two classes—one direct, the other indirect. A fracture produced by direct violence is one in which the bone is broken immediately under the point upon the surface where the fracturing force is exerted. A fracture by indirect violence is one in which the fracture takes place at a distance from that point. The important clinical difference between these two types of fracture depends upon the injury done the overlying soft parts at the site of fracture. The type of fracture produced by direct or indirect violence depends upon the mechanism involved.

¹ Paper read at the biweekly conference of medical officers at the United States Naval Hospital, San Diego, Calif., Mar. 22, 1923.

Fractures due to muscular action include only those in which the rupturing force is exerted by the muscles alone without the aid of any external violence.

In approaching a fracture the first objective sign to be noted is that of deformity, which, employed in its widest sense, includes changes in the relationship of fragments of the bones to each other and modification in the appearance of the part. Deformity may be recognized by simple inspection, or may only be determined by careful palpation and measurements when compared with those of the opposite limb. The appearance of the limb will be modified by swelling, due to extravasated blood and inflammatory exudate, and in overriding fractures where its transverse diameter is increased. Ecchymosis is rarely absent, although its appearance may be delayed for several days. Its appearance at certain points gives rise to strong inference of a break in the bone, as when it appears beneath the malleoli in Pott's fracture. In fractures communicating with joints deformity exists due to the filling of the joint cavity with blood or inflammatory effusion.

Abnormal mobility appearing after injury at a point where it did not previously exist and permitting the bone to be bent at an angle or a portion of it to be moved while the other portion remains at rest is pathognomonic of fracture. It is not always present or recognizable. The manipulations employed to demonstrate abnormal mobility vary with the site of fracture and the kind of mobility which one attempts to produce. In fracture of the shaft of a long bone, angular displacement may be demonstrated by passing the hand under the limb at the supposed seat of fracture and gently raising it; or by firmly grasping the two extremities of the bone and moving the lower one slightly from side to side while the upper one is held stationary; or the limb may be grasped on either side of the supposed fracture and transverse displacement made by moving the fragments in opposite directions. In fracture of the shaft of the fibula, lateral mobility may be detected by grasping the leg above and below the fracture and making alternate pressure against the bone. In fracture of the upper end of the tibia, where lateral or angular mobility can not be easily demonstrated, direct rotary movements of the lower portion of the limb are made while the upper portion is held stationary with its bony prominences distinctly felt. Abnormal mobility is recognized by failure of transmission of the rotary movements from the lower to the upper fragment. It is sometimes possible to demonstrate abnormal mobility when the fibula has been broken just above the ankle by inward pressure over the tip of the external malleolus, thus causing the upper end of the lower fragment to move outward.

Crepitus is the sound produced or sensation communicated to the hand by the friction of fragments of a broken bone against each other. It, like abnormal mobility, is pathognomonic of fracture and these two signs usually coexist. Contact of the fragments is necessary for the production of crepitus. It is produced by the same manipulations used to demonstrate abnormal mobility. In addition to the above, the roentgen ray affords a valuable means of detecting fractures of bones and with modern facilities in the practice of medicine we have come to depend perhaps more on the skiogram than clinical ingenuity. Care, however, must be exercised in the interpretation of X-ray plates.

Under subjective symptoms loss of function is a common result of fracture and is due either to mechanical causes or the inhibitory effect of fear or pain. The presence or absence of this symptom is only suggestive, not indicative, of the presence or absence of a fracture. In most cases of fracture of the long bones the limb is practically helpless, but at times one meets with a patient who can move or even walk with a broken leg. Pain, either spontaneous or upon pressure or movement of a broken bone, is a constant symptom of fracture. Spontaneous pain when the part is at rest is usually slight and not definitely referred to the site of fracture. It is not significant. Localized pain upon pressure or movement is a valuable symptom and in some cases is the most valuable one that can be obtained. It may be sufficient in itself to justify the diagnosis of fracture. By employing pencil-point pressure with its attending pain one is often able to even outline the exact line of fracture. It is of especial diagnostic importance in the absence of other positive findings, and its absence is often a positive means of excluding fracture. The absence of pain upon handling an important fracture may be indicative of central nervous disease or commencing delirium tremens.

The history bearing upon the diagnosis of fracture should include earlier injuries which may have modified the form of the part, the nature of the accident and the manner in which the force was applied; the interference with function, and occasionally the snap heard at the time of injury, and any observed distortion of the limb. A knowledge of the manner in which the violence was applied is sometimes of value in determining obscure points, and where definite information is lacking indications may be gathered from the position of contrusions or of stains made by contact with the ground. The statements of the patient as to how his injury actually occurred should usually be taken with a grain of salt.

The diagnosis of fracture is made upon the above facts. They are not all present in every case, and it is never necessary to seek

for all of them. Deformity, abnormal mobility, and crepitus are alone absolutely pathognomonic. When these are not found, or when a fracture has been demonstrated and more detail is desired, the X ray should be employed. In the absence of the X ray a diagnosis may be definitely made with the help of anæsthesia. The compound character of a fracture is easily determined. In fractures by indirect violence the wound in the skin close to the seat of fracture is usually small and bleeds more freely than a simple wound of the skin. In fractures by direct violence the wound of the soft tissues is usually large and ragged and the broken ends of the bones can be seen or felt through it. Poking around in a wound should not be indulged in for the sake of diagnosing a compound fracture.

The treatment of fractures in general resolves itself into mechanical problems which may be simple or complex, each fracture calling for its own individual solution. To obtain physical results or reduction and to oppose displacing forces or retention at times demand considerable mechanical ingenuity. If one is to treat fractures intelligently it is therefore necessary to analyze the problem at hand, taking into account the reciprocal relationship of the fragments, opposing forces, and one's ability to control them. In some cases one's ability to control a fracture fragment is extremely limited, or even nil. In many instances it is impossible to obtain complete anatomical restoration of the fragments and one must be content with a satisfactory functional result.

As a general proposition the treatment of a fracture should begin when the patient is first seen, but this does not mean that reduction and retention are called for at once. A delay of several days is usually advisable where extreme swelling, muscular spasm, or associated lesions are present. The first indications to be met are those of preventing additional injury, the comfort of the patient, and favoring the return to normal of involved soft parts as soon as possible. If the patient is to be moved from the scene of his injury to his home or a hospital, this is accomplished by the application of temporary splints.

Fractures which necessitate confinement are best treated when the bed is narrow and high and the mattress firm. Here in the hospital we place long boards across the frame of the bed, which prevent sagging of the springs.

Other points to be considered vary greatly in different cases, depending upon the portion of the bone involved. Among these are complications that either exist or are feared—old age, health, and habits of the patient. After the immediate indications have been met and reduction is indicated every effort should be made to bring the fragments into the best possible anatomical relation and

there maintain them. If the fragments are already in good anatomical position retention is all that is necessary. As a general proposition under ordinary circumstances a fair result by simple reduction and fixation is more advisable than a possible better result by open operation.

One of the principal causes of displacement after fracture of the shaft of a long bone and also one of the principal difficulties met with in reduction is tonic contraction of the attached muscles due to the unsupported weight of the lower segment of the limb. When this condition exists the obstacle may be overcome by traction in the direction of its long axis, the different joints being usually held in partial flexion in order to assist muscular relaxation. In some cases by maintaining this traction the muscular resistance is overcome and after reduction the fragments remain fixed. In other instances traction over an extended period of time may be necessary to hold the fragments in proper apposition until sufficient healing takes place.

Another serious obstacle to reduction may be the intervention of soft parts between the fragments. In the reduction of compound fractures, if it is found difficult to maintain the fragments in proper apposition, it may be well to enlarge the external wound through which the reduction may be guided. In impacted fractures it is sometimes necessary to break up the impaction in order to obtain the best results in reduction. In some fractures, such as Pott's fracture, the character of the displacement is so common that a formula can be made for its treatment.

The objects of retention are to prevent displacement of the fragments, to relieve the force of gravity and muscular contraction, to protect the limb from external violence during the process of repair, and to prevent pain that would be caused by movement of the fragments.

The means employed in maintaining fixation are varied and sundry, the fracture being dealt with suggesting the type of apparatus which should be used. Ordinarily in the course of treatment the first means of immobilization are employed temporarily and include removable dressings. As the process of repair advances and indications for close observation and supervision of the part no longer exist, permanent dressings are used. After removal of the permanent dressings hydrotherapy, massage, and gradual use of the part are begun and continued until the return to normal is accomplished.

When fractures communicate with joints, the earliest possible motion of the joint is desirable in order to obtain the best functional result.

In fractures of the upper end of the tibia and fibula or the tibia alone, the line of fracture may be transverse, oblique, or longitudinal;

in the latter cases the knee joint is involved. The tuberosities of the tibia may be crushed. The mechanism in these fractures is usually brought about by the combination of body weight and lateral flexion of the leg upon the thigh. The diagnosis is made by recognition of the irregularity of outline, pain on local pressure, and on pressing the leg upward and possibly abnormal mobility and crepitus. In transverse fractures high up they are sometimes mistaken for a subluxation of the knee. The prognosis in these fractures is especially serious because of the close proximity of the knee joint and the possibility of inflammatory complications. The treatment consists of correcting the displacement by traction and direct pressure. Retention is effected either by permanent traction or a suspended posterior splint with the knee partly flexed. If the fracture is compound and suppuration of the joint occurs, free drainage of the pus must be established at once.

Separation of the epiphysis has been reported in a few cases. It appears to be caused by a wrench of the leg, abduction or adduction by which a transverse strain is produced.

Fracture of the spine of the tibia is probably produced by traction through the crucial ligament or by force transmitted through the external condyle of the femur. The most definite symptom is inability to fully extend the leg. The treatment is full extension when possible, and immobilization for a period of at least four weeks.

Avulsion of the tubercle of the tibia, or Osgood-Schlatter's disease, is usually caused by the action of the quadriceps muscle during some violent effort through the attachment of the patellar ligament. We have five such cases in the hospital at the present time. Inability to use the limb immediately after the accident, the recognition of a movable fragment of bone about 2 inches below the patella, localized pain upon pressure, and crepitus may be present. The knee joint and surrounding soft tissues are often swollen and painful, and effusion may be present. The treatment is to press the fragment into place if possible and hold it there by adhesive strips while the leg is held in full extension. In cases with wide separation of the fragment, open operation with suture of the periosteum or nailing may be indicated.

Fractures of the shaft by direct violence may occur at any point, while those due to indirect violence usually occur near the junction of the middle and lower thirds. In these fractures torsion often plays an important part. Any type of fracture common to long bones may be found in fractures of the tibia, and in addition a form of spiral, the V-shaped fracture. Fractures of the tibia produced by indirect violence are usually accompanied by fracture of the fibula. The superficial position of the tibia makes it especially prone to

result in being compound. Almost any form of displacement is met with, the most common being a projection of the lower end of the upper fragment when it terminates anteriorly. One usually finds the signs and symptoms of deformity, abnormal mobility, crepitus, loss of function, and pain. The subcutaneous portion of the tibia is readily examined by passing the finger over it. Reduction of displacement can usually be accomplished by traction at the foot and counterextension at the knee. Retention following reduction depends upon the type of fracture being dealt with. In simple fractures with little displacement, or where reduction has been accomplished, it has been my practice to put the patient to bed for a week to 10 days with the leg made secure and comfortable in a temporary splint. After this time the swelling has usually subsided, and the leg, together with the foot, knee, and lower third of the thigh, are incased in plaster of Paris. If any wounds are present requiring dressings, windows are left in the plaster dressing. Where prolonged or permanent traction are required, this can be accomplished by various means, depending upon the site of fracture and amount of traction needed.

Fractures of the lower end of the tibia with fracture of the fibula are usually caused either by direct violence acting upon its side to crush it, or indirectly through inversion or eversion of the foot to produce a transverse strain which may be aided by body weight. The diagnosis is made by recognition of abnormal mobility and the mobility of the fragments, local pain, and the other signs of fracture. The X ray may be required for diagnosis or details. The treatment should consist of as perfect reduction as possible and is accomplished by traction through the foot and by direct pressure. When the joint is involved the foot should be held in a position at right angles to the leg. Early passive motion should be a part of the treatment. In severe cases of compound fracture it may be best to amputate.

In supramalleolar fractures the mechanism is probably either forcible inversion or eversion of the foot. The diagnosis is made by pain upon pressure over the site of fracture, together with one or more of the usual signs or symptoms. In its treatment the lower fragments should be held in position by a fixed dressing.

Separation of the lower epiphysis of the tibia are more frequent than those of the upper epiphysis. The most common cause apparently comes through a cross strain in eversion or inversion of the foot, or it may be produced by simple twisting of the foot. It may be accompanied by the breaking off of a fragment of bone, and is usually accompanied by fracture of the fibula. The diagnosis and treatment of these fractures are the same as for supramalleolar fracture.

Pott's fracture is caused by eversion and abduction of the foot, assisted by the body weight. The details of this type of fracture vary greatly with the predominating mechanical element in its production. If eversion predominates the force is exerted above the malleolus and rupture of the tibio-fibular ligament takes place. If abduction of the front of the foot predominates there occurs a break of the internal malleolus at its base, or a rupture of the internal lateral ligament, followed by rupture of the tibio-fibular ligament, and as the movement is continued an oblique fracture of the fibula takes place through torsion 3 or 4 inches above the tip of the fibula. With all a widening of the intermalleoli mortise and a backward displacement of the astragalus takes place. The appearance of the part in Pott's fracture is usually so characteristic that the diagnosis can be made by sight. The foot is displaced outward with abnormal prominence of the internal malleolus or adjoining portion of the tibia, and in marked cases the backward displacement is also readily seen. Pathognomonic signs are points of tenderness over the lower portion of the internal malleolus, the site of the tibio-fibular ligament, and over the fibula a little above the external malleolus; abnormal mobility; sometimes a click between fragments upon manipulations, and marked ecchymosis beneath the malleoli, especially the external. The prognosis is good if proper reduction is made and maintained. Reduction is made by pressing the calcaneum forward and inward, and retention is perhaps best made by posterior and lateral splints of plaster of Paris so molded that they maintain the corrected backward and lateral displacements.

Fractures of the malleoli by inversion of the foot are quite common and result in a variety of lesions. There may be a fracture of the fibula alone, the tip of the internal malleolus may also be broken, or a considerable portion of the tibia may be broken obliquely off along with the internal malleolus. The type of fracture depends upon the amount of force of the inversion and the degree to which the body weight enters in as a factor. Tearing of the tibio-fibular ligament adds greatly to the seriousness of fractures thus produced by allowing displacement of the astragalus. If there is only fracture of the fibula and internal malleolus, the diagnosis is largely made through recognition of their points of tenderness and independent mobility. If the lower shaft of the tibia is also implicated, upward and inward displacement adds deformity. In the former reduction with immobilization by plaster encasement is all that is necessary, but in the latter downward and outer pressure over the tibial fragment aided by traction through the foot may be needed. When immobilized, one must guard against backward displacement.

Fractures of the posterior portion of the articular surface of the tibia may occur as complications in Pott's fracture, or may occur independently. They may be small and only detected by the X rays or be quite extensive and capable of being diagnosed by palpation. The treatment is as much reduction as possible and fixation. Backward displacement of the astragalus should be looked for. In some cases removal of the fragment with ultimate ankylosis of the ankle joint may give the best functional result. The foot should be at right angles to the leg.

Fracture of the anterior portion of the tibia is a rare fracture and could probably be corrected by traction through the anterior portion of the capsule and forced depression of the front of the foot together with pressure upon the fragment.

Fracture of the upper end of the fibula alone or separation of the epiphysis is caused by direct violence, muscular action of the biceps, or forcible adduction of the leg acting through the external lateral ligament. It is treated by the best possible approximation of the fragments by bandaging or with adhesive strips and fixing the leg by plaster of Paris with the knee in partial flexion and in such a way as to prevent adduction. In cases where the peroneal nerve is injured it may be necessary to treat the nerve by open operation.

Fractures of the shaft of the fibula are usually produced by direct violence and are diagnosed by localized pain, and possibly deformity, abnormal mobility, and crepitus. Displacement is usually slight because of the splintlike action of the tibia. The treatment is immobilization by a plaster case from toes to above knee, to protect against twisting of the foot and external violence.

Separation of the lower epiphysis of the fibula without other fracture has occurred, but is rare.

In the treatment of compound and pathological fractures the complications must be treated along surgical and indicated lines. The operative treatment of fractures of the tibia and fibula call for the same surgical judgment and consideration as do fractures of other long bones.

UROLOGY AND ITS PLACE IN GROUP MEDICINE.¹

By W. H. CONNOR, Lieutenant Commander, Medical Corps, United States Navy.

Urology, or what is perhaps better known as genitourinary surgery, became a distinct branch of medicine in America in 1851, when Gross published a book devoted to that subject. His was the first American publication, and at that time there were only two other books published in the English language. From that time

¹ Paper read at the monthly conference of medical officers at the United States naval hospital, San Diego, Calif.

until 1877, when Van Buren and the elder Keyes published their book, Gross's publication was the book of reference. As no other comprehensive treatises were published until the nineties, the library of the early student of urologic practice was not large. In 1866, following the solicitation of Keyes, the American Association of Genitourinary Surgeons came into being, and for many years its membership was limited to 30; in recent years, however, its membership has been increased; but even now there are probably not more than 75 in the association. In 1900 the American Urological Association was formed to include the large number of doctors who were devoting their time to urology, and while it has a larger enrollment than the American Association of Genitourinary Surgeons, the latter is by far the more select.

Such has been the development of urology in North America: what can be said as to its development in the naval service? I would not say that it is a development of yesterday, for good urological studies have been made by naval medical officers for years past. It is true that the studies have been infrequent and the progress in that particular branch has been slower than that of other specialties. There are several reasons why that should be true, but perhaps the most cogent has been the fact that the prolific period of life for urological pathology is what may be called the prostatic age. Naval medical officers in the past have had little to do with that period of life, and as a result have been slow to grasp its importance. Again the service has been small and confined entirely to the male sex and to individuals whose ages fall within the limits of 18 and 40. That, with the periodic physical examination, by which the unfit are eliminated, would tend to limit the urological patient.

The late war was a stimulant for this branch of medicine for various reasons:

(1) Men trained in urological technic became affiliated with the Navy and naturally being interested in this particular branch sought that type of work and were able to establish diagnoses where the ordinary naval medical officer might have failed.

(2) Naval medical officers were brought in contact with both sexes and practically all ages.

(3) The rapid advancement that had been made in urological studies of our civilian confrères and the exactness with which a diagnosis can be made have become apparent to all.

Another fact is that naval hospitals are not confining their activities to the active personnel, but are becoming more and more like civilian hospitals; I refer to the accepting of Veterans' Bureau cases, navy yard employees, and the possibility of the out-patient departments sooner or later becoming feeders for the hospital. The

classes of patients enumerated above will eventually bring the naval medical officer into contact with each sex and all ages. With such an outlook it is important that urological study should become an established fact in our hospitals and that naval medical officers should become conversant with it. In 1920 at the Mayo Clinic approximately 1 in every 10 patients registered at the clinic were examined by the cystoscope. Of course, that is a greater percentage than would obtain at any hospital other than one devoted entirely to genitourinary conditions; still it does show the importance of cystoscopy.

In approaching a urological case the procedure differs in no way from that of any pathological condition. A careful, complete, and concise history with a careful physical examination is essential, followed by that most important factor, an intimate study of the urine. In every case a catheterized specimen is desirable but in the female it is absolutely necessary, while in the male the second of a three or more glass test is sufficient. In collecting the specimen from the male the act of urinating should be observed, for we can note the size and power of the stream, the time of emptying, etc., which are of some importance.

Having obtained the urine in a clear—preferably a sterile—glass, we are ready to proceed with the macroscopical, chemical, and microscopical examination. Each method of examining is important, the microscopic being the most important of the three, for by that method we will determine whether or not pus, blood, crystals, or infection is present. If in a suspicious urological case several urinary examinations are negative for the above elements, we are quite sure that a further study of the urine from the separate kidneys will add nothing. There will be cases which will require further study, particularly those cases where proper drainage of the kidney is not at all times possible, either from some abnormality in the ureter, the periureteral tissue, or in the kidney itself. In such conditions a pyelogram and ureterogram in the reclining and semireclining position will be necessary to establish a diagnosis.

If we have found blood present, we think of calculi, tuberculosis, ulcer, etc., and a roentgenogram of the entire tract is indicated to determine the presence or absence of urinary calculi. The location of tuberculosis, pyelitis, etc., will usually require separate urinary study. If pus is present, we know that some inflammatory disturbance exists. If a pyuria is present, and we are unable to find an organism by the usual staining methods, we must consider tuberculosis. With some types of infection, notably colon, we may not find any leucocytes. The absence of leucocytes, then, will not necessarily eliminate the possibility of infection.

In determining infection it is essential to note whether we are dealing with a bacillus, a coccus, or mixed infection, for our treatment and prognosis will vary in each case. It is in the examination for infection that the desirability of collecting the urine in a sterile receptacle can be seen, for in this way we should be able to guard against outside contamination. This is especially important if the examination can not be completed at once, as it is a notorious fact that organisms will multiply rapidly even in such a pabulum as stale urine.

As conclusions are drawn from this examination that are vital, it is important that the one who is to make the diagnosis should have under his control as many of the factors upon which a decision is rendered as possible. For instance, one should know how long the urine was centrifuged. Was it centrifuged in a sterile tube? Was examination made at once or the next day? Are there many leucocytes? In the infection heavy? The best way to control these factors is for the operator to do his own laboratory work in his own workshop, reserving the special examinations, e. g., identification of cultures, etc., to the laboratory expert.

Having decided by the presence of blood, pus, or infection that some pathological lesions exist in the urinary tract, it behooves us to know whether the bladder, ureter, or kidneys are at fault. Before proceeding with cystoscopy, and if necessary ureteral catheterization, we should determine whether or not there is a lessening of kidney function. The importance of this test preceding a cystoscopic examination can best be shown by the following case. The patient in whose urine tubercle bacilli had been demonstrated walked into the office and stated that for the last few days he had been feeling poorly. He had felt as badly on other occasions and had "fought it off." At this time he felt a little more worried about himself than usual. Of course, it was important to determine whether one or both kidneys were infected, and ureteral catheterization was considered. Prior to that manipulation a functional test was performed and the dye failed to appear in two and one-fourth hours. He was sent home. A cystoscopic examination was not made at that time and was absolutely contraindicated, as it would probably have been sufficient to further inhibit urinary secretion with a possible fatal result. Of course, this was an extreme case, but in formulating a routine it is better to so design it that each step will be taken in proper order. In this way we know to a certain extent what the patient's reaction may be to further study.

Having determined from a study of the urine and the functional test that further examination will be required, the cystoscope is passed, and a thorough study of the bladder is made. Sufficient cause for our pathology may be demonstrated in the bladder; if not

then one or both ureters are catheterized and the same method of urinary study and determination of function, as noted above, is made from the respective kidney secretion. If a roentgenogram of the kidney is desired a solution of sodium bromide or iodide may be introduced through the ureteral catheter. Pyelograms should not be made of both kidneys at the same sitting except with extreme care.

Having studied the urine, obtained the functional capacity of the respective kidneys and made urograms, we are now ready to make a diagnosis and outline our treatment. We have determined the kidney or kidneys that are at fault, what the function of each is, and if it should be necessary, during a surgical procedure, to remove a kidney, whether or not we can expect the remaining one to do the necessary work.

If we are dealing with infection, is it a coccus or bacillus and are we dealing with a primary or secondary infection? The Mayo Clinic has shown that practically all infections of the kidneys are secondary to some focus harboring cocci, and that even in those cases that seem to contain colon bacilli alone the presence of the latter is only of secondary importance.

From the chronicity of the infection and the difficulty of eliminating kidney infections by local measures it would seem that we have not been attacking the primary focus. Needless to say then we look to the mouth and accessory sinuses for the focus, not forgetting of course some of the other less frequently offending organs. In dealing with calculi it would be well to carry out a thorough search for focal infection, as the Mayo Clinic states that recurrences of calculi are due or at least coincident with the demonstration of focal infection. We know that gallstones are prone to follow typhoid or other gall-bladder infections, and as a result surgeons have been prompted to resect that organ. It is possible then that secondary kidney infections may be a harbinger of kidney calculi.

On the other hand Barney in a recent investigation made at the Massachusetts General Hospital has shown by roentgenograms made directly after operation that in 9 of the 20 cases investigated kidney calculi remained, following what was considered thorough removal.

This would represent 45 per cent of cases in which we could expect a recurrence, as Barney states a better technic should be found and this may be obtained by the use of the fluoroscope at the operation.

We had in this hospital a short time ago a patient who had a kidney stone removed in July, 1922, and at the present time (eight months after) a roentgenogram shows a stone of some size in the pelvis of the kidney. It would be interesting to know whether or

not any calculi remained at the close of the previous operation. Up to the present time no focal infection has been found. It is of interest to note that the original stone caused him no symptoms and he would not know that he now has a stone were it not for the X ray. He does have blood cells and a considerable number of leucocytes in his urine.

From the above it is easy to see how cooperation in the different branches of medicine is necessary and how difficult it would be to make satisfactory diagnosis without this cooperation. And in the case with the recurrent stone the roentgenologist reported the presence of a shadow suggestive of stone in the right kidney region. It was cystoscopy, ureteral catheterization, and the pyelogram that definitely located the stone in the pelvis of the kidney. Ureteral catheterization also made it possible to obtain a functional test and gave us an idea as to how much drainage had been done to that kidney by the previous nephrotomy and the recurrent stone.

The urologist can aid the internist in certain obscure conditions when the only symptom that the patient may complain of is pain in the lumbar region. Normal appendices have been removed with no harm to the patient but some embarrassment naturally accrues to the operator who finds that appendectomy has not removed the symptoms and further study shows a calculus in the kidney. A second operation with removal of the stone relieves the symptoms. In obscure parasymphilitic conditions a cystoscopic examination may aid in establishing a diagnosis.

On the other hand the urologist must see that his patient is thoroughly overhauled by the rhinologist and oral surgeon in order that a focus of infection in these areas may be eliminated.

As it has been by cooperation that civilization has made such rapid strides so it will be in medicine that the rapidity with which we advance will be in proportion to the seriousness with which the different branches cooperate with one another. In this way only will the maximum of cures be consummated.

THE RÔLE OF THE ROENTGENOLOGIST IN A MODERN HOSPITAL.¹

J. B. FARRIOR, Lieutenant, Medical Corps, United States Navy.

The subject that I have been asked to speak on is one that is too broad to do justice to in the short space of time that is allotted me. The roentgenologist is so closely associated with all branches of activity in a hospital that his work is almost as large as all the branches combined. I am not speaking of the X-ray technician who

¹ Paper read at the bimonthly conference of medical officers at the United States naval hospital, San Diego, Calif., Feb. 8, 1923

is expected to take pictures or give sittings, but of the trained roentgenologist who is the consultant. Anyone who knows a little electricity, physics, and elements of photography can take good X-ray pictures after he has learned what pictures are wanted, but the roentgenologist is a consultant who has had as good a medical education as the internist or surgeon with whom he is called in consultation, and in addition he must know how to interpret shadows that are made on an X-ray plate. He supplies a group of facts, obtainable only through his method, that are often of the greatest importance in modern comprehensive and exact diagnosis, and many times he is called upon to treat the conditions that he has helped materially to diagnose.

Just as the internist, the surgeon, the genitourologist, the otolaryngologist, must possess a knowledge of the anatomy, physiology, pathology, and even histology of all parts of the body, so must the roentgenologist possess this knowledge. Upon this knowledge depends his ability to interpret the shadows of varying density seen on the fluoroscopic screen or X-ray film. Without this knowledge he is not a roentgenologist but just an X-ray technician who takes pictures.

In this hospital a patient is admitted, his history is taken, and he is routed to the various departments, where he is examined by specialists. These specialists in turn take short histories and make clinical examinations and send their reports back to the head of the department from whence came the patient. The head of the department then takes all the data thus collected and digests it and makes a diagnosis of the condition.

This sounds like a simple process, but there is more in it than one would at first suppose.

John Smith enters the hospital with diagnosis undetermined; he is a tuberculosis suspect. He is carefully examined by the internist. This examination includes both history taking and thorough physical examination. Smith is then sent to the X-ray department for chest examination. The internist wants a check on his physical findings. Then he is sent to the dentist, the eye, ear, nose, and throat department, the genitourinary department, and the laboratory. The dentist sends him for dental radiograms, the otolaryngologist for "sinuses," because, no matter how positive his findings may be, he wishes a check more efficient than transillumination. The urologist sends him for kidney, ureter, and bladder pictures. If the findings are insufficient and the case remains obscure, the internist calls on the radiologist for a gastrointestinal examination.

This is the rule of procedure, and you can see that the roentgenologist is intimately associated with all departments.

The roentgenologist has not the help of the reports of the various men who have examined the patient clinically, and oftentimes he has not even seen the patient and you don't see why he should be consulted. Much is to be gained by X-ray reports that are made first without knowledge of the patient's history and clinical findings; but the most is made of a case if, after this report has been made, the roentgenologist be made familiar with the anamnesis, symptomatology, and clinical findings and then consulted. It is helpful to the internist or surgeon interested and it is helpful to the radiologist, because it enables him to become more efficient. A good roentgenologist can be a great help in making an obscure diagnosis at times. Even in those cases where X-ray findings are unnecessary the roentgenologist should be consulted, so that he can check himself and thereby become more efficient in cases that are not so perfectly evident.

The ideal plan, even though time consuming, is for the clinician and roentgenologist to confer on all cases when all the clinical and laboratory findings are considered, and then to check the subsequent clinical course, the operative findings, and in fatal cases autopsy findings. To do this makes for X-ray efficiency.

No better example of the successes of X-ray examinations on the one hand and of its limits on the other could be given, perhaps, than the results obtainable in the study of diseases of the respiratory system. No internist to-day would be willing to try to get along without information of the X ray can give concerning the lungs, pleura, the air passages, and the lymph structures and blood vessels of the respiratory organs. X-ray examinations of the para-nasal sinuses and of the chest have become routine in the study of cases here. The nose and throat men appreciate the value of roentgenograms of the maxillary, frontal, sphenoidal, and ethmoidal sinuses, and I dare say that they would hardly venture an opinion on conditions involving these areas without first seeing the X rays, for the information acquired from roentgenograms is more reliable than that obtained by transillumination.

The internist can compare the physical findings of the lungs and pleura with the findings in the X-ray plates, especially if he suspects a dilatation or a stenosis in the bronchi or an inflammatory or neoplastic process. If gangrene or abscess of the lungs or empyema be suspected he can confirm his clinical finding, and if operation is indicated he can determine the exact size, position, and extent of the focus or cavity. He can get a pretty fair idea as to what the success of the operation will be. In lung abscess the upright position of the patient gives a fluid level and the recumbent position gives a shadow of regular density making the diagnosis of this form of abscess sure.

In pulmonary tuberculosis the X ray is less helpful in deciding that tuberculosis exists than in giving definite ideas as to the exact location and extent of the process. The X ray demonstrates the exact location and extent of the process, but it will not always determine whether the process is tuberculous or how much of it is tuberculous and how much is complicating bronchitis or broncho-pneumonia due to a coexisting staphylococcus or streptococcus infection. The X ray is credited with the ability to determine the activity or inactivity of a tuberculous process, but this is giving it too much credit, generally speaking. Roentgenologists have, under pressure of patients or doctors, made diagnoses of the activity of a process that should not have been made and the persons concerned have suffered. Occasionally a roentgenologist makes a negative report when tubercle bacilli are present in the sputum. He may be correct as far as X-ray examination goes, because it is possible for minimal tuberculosis to cast no shadow in some cases. It is only fair to say in this connection that it is not infrequent that an X-ray plate shows advanced tuberculosis and the clinician and laboratory report negative findings, and then the patient breaks down and confirms the X-ray diagnosis. Many times—it is the rule rather than the exception—the X-ray plate shows more involvement than the physical finding would indicate and a much more valuable prognosis can be made.

X rays are valuable at times in determining enlarged paratracheal glands, hilus glands, and hilus tuberculosis, as well as peribronchial and miliary tuberculosis. You should not expect too much information as to the etiology of chest shadows, however.

In diagnosing tumors of lung the X ray often clears up the etiology of bloody sputum, dyspnoea, etc., and causes the primary tumor to be sought and located. Occasionally a reputation is made or saved for the internist when a primary new growth simulates tuberculosis or pneumonia and he makes the correct diagnosis by X-ray help. The X ray is helpful in determining the thickness of the pleura. Aneurysm can be distinguished usually from mediastinal tumors that give the same physical signs. Substernal thymus or thyroids will show and often throw light on an obscure case.

One of the triumphs of the X ray consists in the easy diagnosis of aortic aneurysm. The ease with which this condition is determined by X rays makes the older methods seem useless. I have seen as many as nine aneurysms demonstrated on one patient, when only two gave physical signs at a rather thorough examination. Moreover, the X ray gives exact information as to the location, size, and direction of expansion, where physical finding can only vaguely indicate such. A routine examination for aneurysm should be made in all old syphilitic cases because of the fact that small aneurysms are so easily missed clinically.

The study of the heart and great vessels by the methods known as orthodiagraphy and teleroentgenography is valuable in determining the size of the individual parts. By a system of measurements of the heart and vessels and comparing these with normal measurements heart conditions can be determined that in some cases can be determined by no other method. This holds true in fat individuals. By this method the size and even volume of the heart can be determined accurately. Valuable information can be obtained in such conditions as valvular disease, hypertrophy, and dilatation of chambers, congenital malformations, and in diseases of the myocardium and pericardium.

More time, energy, and equipment have been spent in study of the digestive apparatus than in any other branch. Fully 40 per cent of my patients here are for dental X rays. Examinations of the gastrointestinal tract by fluoroscopy and serial plates, gall-stone pictures, and barium enemata make up another 10 per cent that totals 50 per cent of the work we do. Dental X-ray examinations have revolutionized both medical and dental practice in the past few years. Internists in the search for focal infections have discovered that bad teeth may be the cause of sinusitis, endocarditis, myositis, nephritis, and indirectly, as Doctor McIntire has shown you, it is the cause of some cases of optic neuritis, iritis, and chronic bronchitis. They have taught the dentist the danger of devitalizing teeth and to give the needed care in all extractions. They have learned that a tooth poorly and carelessly extracted can do as much harm as it ever did because the apical granuloma and the rotten root apex was left in the mouth, even though the crown was removed.

The diagnosis of disease or anomaly of the esophagus is easy. The X ray locates a foreign body in this organ exactly, and by the aid of fluoroscopy the foreign body can easily be removed.

The study of disease of the stomach and duodenum and of the large gut has advanced more rapidly and further than any other, I believe. The information that the X ray gives in regard to these structures and conditions involving them fills volumes, and I can not begin to give it all here. The X ray is the most valuable single diagnostic method that we have at our disposal in determining gastric or duodenal ulcer or cancer. Cancer of the colon, diverticulitis, colitis, stricture of the colon or rectum, gall bladder disease, or appendicitis.

The X-ray report is not infallible by any means, but as a diagnostic means it is invaluable. Carmen says that 90 per cent of gastric and duodenal ulcer and cancer can be diagnosed by X-ray examination alone, and he proves it. When an ulcer is old and its walls thickened it is an easy matter to diagnose the condition, because a posi-

tive sign is evidenced. A crater or niche shows in the regular stomach line and is pathognomonic of ulcer. When, however, indirect signs in the form of functional disturbances are the only ones in evidence it is another story, and it is then that the roentgenologist needs all the help that he can get. I might add that this same holds true in disease of the appendix. The positive signs of stomach ulcer are few, namely, niche or crater, hourglass contraction. The indirect signs are many, some of which are local spasms, incisures of the greater curvature, changes in peristalsis and emptying time, and localized point of pain on fluoroscopic examination. For duodenal ulcer they include spasm of the bulb, filling defects, reflex gastrospasm, and other signs of disturbed function. When no direct ulcer signs are present the roentgenologist must consider appendicitis, gall-bladder disease, localized peritonitis, and nervous gastropathies as the cause of function disturbances or indirect signs. It is here that he needs help from the internist or surgeon, and at the same time he has valuable information to impart. It may be negative or affirmative.

The differential diagnosis between stomach and duodenal ulcer is quite difficult at times, and a history is most valuable to the roentgenologist. In cancer of the stomach X-ray examination gives important information. It frequently reveals tumor or cancer signs before there are any clinical symptoms. Mistakes are made, however, and ulcer is diagnosed cancer, and vice versa. The history of the case may influence the diagnosis.

In the study of gall-bladder disease less help is rendered than in ulcer cases. Only about 10 or 15 per cent of gall stones show on X-ray plates, and a cholecystitis does not cast a shadow unless the bladder walls are markedly thickened or unless there are pericholic adhesions. We hope to have better success in demonstrating gall-bladder pathology when we install the expected new equipment, Bucky diaphragm and new screens.

Much information can be gathered from examination of the gall-bladder region anyway, and it is well worth the time spent.

The same can be said of the region of the appendix. I am beginning to believe, however, that appendectomy should not be performed as the result of X-ray findings alone. Clinical findings are essential.

Carcinoma, strictures, and tuberculosis of the colon, ulcerative colitis, and other diseases of the colon have peculiar signs or filling defects that render diagnosis fairly easy.

The urologist owes much to roentgenology for the help that it yields in diagnosing calculi in the kidney, ureter, and bladder, and in determining the position of kidneys and the condition of ureters. Pyelography, with some opaque solution, is indispensable in deter-

mining the shape, size, and condition of renal pelves and the presence of ureteral stricture, kink, or stenosis. Diverticulæ of the bladder, or bladder or prostatic tumors, can be demonstrated by the same technic. X ray plays such an important part in urological examination that I consider it essential that a special urological room be built in connection with the X-ray laboratory.

Next to the digestive apparatus in number of patients examined comes the locomotor system. Invaluable light is thrown on fractures, arthropathies, bone diseases, and bone anomalies. It is hardly worth while to enumerate the many conditions that the X ray can diagnose in locomotor-system pathology, because you are familiar with them.

In studying the nervous system the X ray is valuable in some diseases. Some brain tumors can be localized; Charcot joints, spina bifida, cervical ribs, tumors, and aneurysms pressing on nerves can be determined, but usually other methods of diagnosis are to be chosen.

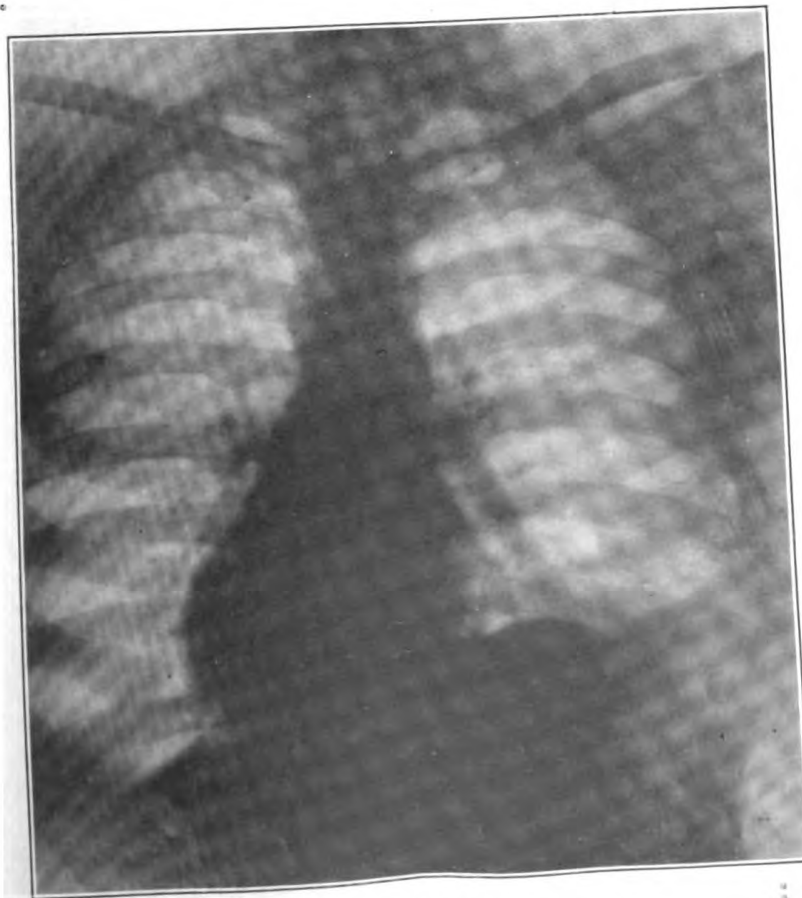
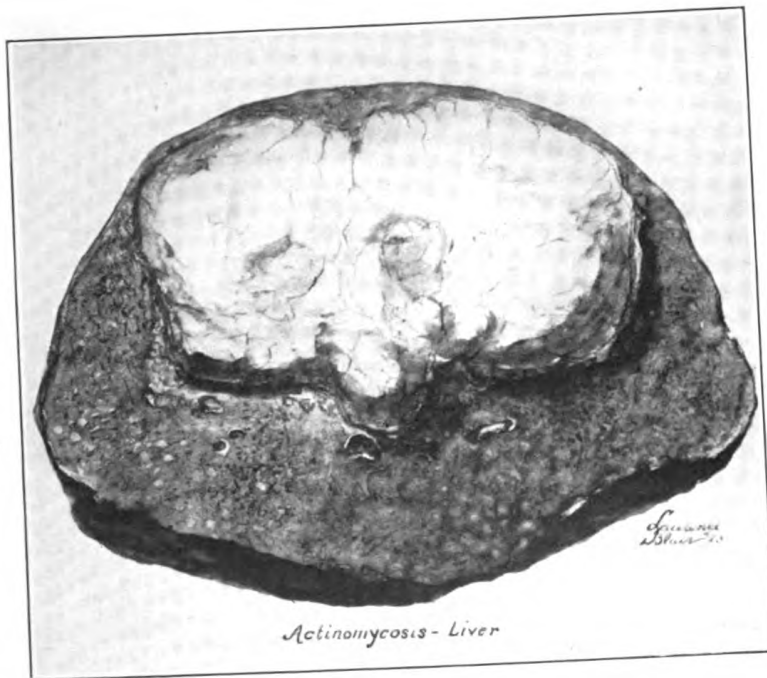
This paper has consumed about all the time that has been allotted me, but before I close I want to mention the X ray as a therapeutic agent in dermatological affections. Over 80 skin diseases have been treated successfully with the X ray alone. It has been proven that it is the most useful single therapeutic agent in the whole armamentarium of dermatological therapeutics. Some diseases can be controlled only by the X ray; in some it is the method of choice, and in others it is a valuable accessory.

In the first group are localized bromidrosis and hyperhidrosis, keloid, favus, rhinoscleroma, tinea tonsurans, granuloma fungoides, pruritis, leukemia cutis, and several less common diseases.

In the second group are blastomycosis, carbunculus, collositas, lupoid sycosis, scrofuloderma, sycosis vulgaris, synovial lesions of the skin, tinea barbae, lupus vulgaris, verruca vulgaris, epithelioma (basal cell), acne vulgaris, and several others.

The third group comprises furunculosis, pityriasis rosea, sporotrichosis, hypertrichosis, rhinophyma, sarcoma, dermititis venenata, intertrigo, lichen planus, psoriasis, tuberculide, and many others.

In conclusion, I wish to state that I have tried to give you the opinions of men nationally known as our great internists and surgeons, and I hope that I have impressed you with the fact that the rôle of the roentgenologist in a modern hospital is that of a consultant who has most valuable information to impart. He is a specialist in a diagnostic method that is invaluable to every branch of the diagnostic group, and that without him exact and comprehensive diagnosis would be tedious and in some cases impossible.

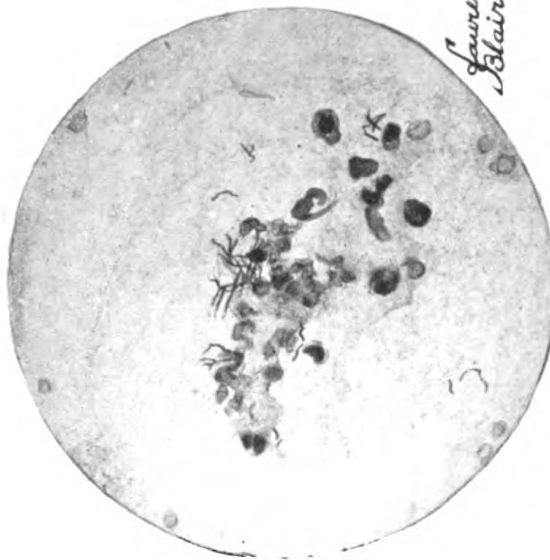


High Right Diaphragm.

340-1



*Actinomycosis: Colonies in section
of Liver. - 16mm objective.*



*Lawrence
Blair '33*

*Actinomycosis: Filaments in smear from
pus in Liver. - 1.9mm objective.*

CLINICAL NOTES.

CASE REPORT OF ACTINOMYCOSIS OF LIVER AND LUNGS.

By G. F. COTTLE, Lieutenant Commander, Medical Corps, United States Navy, and R. C. SATTERLEE, Lieutenant, Medical Corps, United States Navy.

A beneficiary of the United States Veterans' Bureau was admitted to the surgical division from the medical division of the United States Naval Hospital, New York, N. Y., March 22, 1923, for exploration of the right chest and abdomen. He was married, had two children, and was 32 years of age. Family history was negative. While in the Army in France in 1918 he had been gassed and has been receiving compensation from the Government for chronic bronchitis since the period of the war. Five months ago, October, 1922, a pain in the right side of his abdomen led to an operation in a civilian hospital for appendicitis. For a month after this operation he was well, gained weight, and had no complaint except his cough; then the pain in his right side returned, his cough increased, he became weak and sick, had night sweats and loss of weight. He was admitted to the medical wards a month and a half ago with a tentative diagnosis of pulmonary tuberculosis, and since that time up to date he has had an irregular up and down fever of "septic" type with sweats but no definite rigor. At first temperature was 99° to 103°, later 97° to 102°, respiration 20 to 24, later 28 to 30. The pulse rate at first in proportion to the fever later became more rapid. He has lost 34 pounds in two months and has become increasingly anemic. Twenty-four examinations of his sputum have been negative for tubercle bacilli. Once there was a report of leptothrix with gram positive bacilli and cocci. Wassermann was negative, no malarial parasites, no parasites or ova in the stool. A barium series showed delay in emptying the gastrointestinal tract. Enlarged liver. Red Blood cells, 2,590,000; hemoglobin, 40 per cent (Tallquist); leucocytes, 23,800. Differential count: Neutrophiles, 83; lymphocytes, 13; mononuclears, 4. Urine, amber, acid, 1,010, marked trace of albumen, no sugar, many hyaline casts, leucocytes 40 to field, occasional erythrocytes, occasional squamous epithelial cells. X rays of chest were taken on three dates: February 6, 1923—thickened pleura and infiltration at right base, no fluid; March 2, 1923—condition at right base is worse, right diaphragm is very high due to abdominal pathology; March 22, 1923—areas of increased

density at base of right lung, probably pus, no change in liver pathology. (See illustration showing high right diaphragm.)

Examination showed an emaciated, waxy pale, anemic young man with a protuberant thin-walled abdomen who had a moderately productive cough. At the right base there was flatness or dullness up to the eighth intercostal space in the axillary line. The heart was rapid but otherwise normal in sound and size. The protuberance of the abdomen seemed due to a greatly enlarged liver, which was palpated four fingers below the costal margin, where it rose and fell with breathing and seemed smooth, not nodular and not tender. Signs of free fluid were present. Spleen was palpable and both spleen and liver felt hard.

The ankles and legs below the knees were swollen and edematous. Paracentesis of right chest was negative except that the needle seemed to be in a large empty cavity. At operation through a right rectus incision the liver was found twice its normal size, hard, and slightly adherent to the diaphragm over right lobe. The spleen was twice its normal size, firm, and nonadherent. Stomach, kidneys, intestines, pelvis were normal. There were adhesions at the site of the former appendectomy, and ascitic fluid was present. The gall bladder was distended to twice its normal size and contained green bile; it was emptied and drained.

The day after the operation the patient became cyanotic, developed signs of edema at the left base, and died.

Autopsy revealed a greenish necrotic area on the dome of the right lobe of the liver 6 inches in diameter. Multiple necrotic nodules the size of a hazelnut were scattered through both lungs.

The pus from the necrotic area of the liver showed no organisms on direct smear except nonbranching fungus filaments. Cultures from the liver were negative. The pus contained quite a large number of grayish nodules about 1 millimeter in diameter, which proved on section to be actinomycoses colonies. Pus from the lung nodules showed the same rodlike filaments that were found in the liver pus, as well as numerous bacteria, principally streptococci on direct smear. *Staphylococcus pyogenes aureus* and short-chained streptococci were found in cultures. Culture on brain broth showed large boat-shaped gram-positive organisms with bipolar staining. The actinomycoses colonies were found also in sections from the lung nodules. Undoubtedly the "leptothrix" reported in the sputum were filaments of this fungus which appeared when a nodule would break into a bronchiole and the contents of the nodule were expectorated. The colonies of this fungus did not show the peripheral "clubs" characteristic of the bovine type of actinomycosis. All attempts at culture of this organism have failed so far, and white mice inoculated with pus from the liver in the peritoneal

cavity showed no ill effects after one month. Sections of the liver and spleen showed amyloid degeneration of these organs. No actinomycoses colonies were found in the spleen, and cultures were negative.

This case is reported because it is one of chronic sepsis, whose origin was not determined clinically or by exploratory operation. The X-ray pictures seem to be of especial interest because the two diagnoses considered before operation were abscess of the liver and subphrenic abscess, neither of which proved to be the correct one from the surgical standpoint. Surgical drainage was not possible because of the high position of the liver mass and also because the mass was not fluid. Iodide medication was not instituted because the diagnosis was not established until the autopsy and microscope revealed the true pathological condition. The portal of entry for the infection is unknown. The pathologist felt that the pulmonary infection was secondary, not primary.

THE INCIDENCE OF NEUROSYPHILIS IN TREATED CASES ON THE ISLAND OF ST. CROIX, VIRGIN ISLANDS OF THE UNITED STATES.

By F. L. MCDANIEL, Lieutenant, Medical Corps, United States Navy.

Soon after the transfer of the Danish West Indies (Virgin Island group) to the United States in 1917 naval medical officers were detailed to take charge of and reorganize the various municipal medical activities in the islands. These medical officers found a widespread prevalence of venereal disease in this newly acquired territory. Under an ordinance which had passed July 6, 1906, by the colonial councils and approved by the Danish Government, venereal diseases were made reportable and treatment compulsory.

Complete case histories are on file since 1918 of all patients who have been diagnosed as syphilitic and who have been treated at the dispensaries and civilian hospitals on the island of St. Croix. These patients were diagnosed by their clinical history, physical findings, and all were subjected to a confirmatory Wassermann reaction.

In order to standardize the method of treatment of syphilitics, the following procedure was outlined and rigidly adhered to: After the diagnosis had been established, the patient's physical condition not contraindicating, he was immediately started on a mixed treatment of arsphenamine and mercurial injections, the first course consisting of 3 intravenous injections of arsphenamine and 12 intramuscular injections of salicylate of mercury, given at weekly intervals.

Mercury was given as follows: The stock solution was made up so that 1 cubic centimeter contained 1 grain of salicylate of mer-

cury. As a first dose the patient was given one-half of a cubic centimeter; second dose, 1 cubic centimeter; third dose, $1\frac{1}{2}$ cubic centimeters; and 2 cubic centimeters for all following doses, until a total of 12 injections had been given at weekly intervals. As a first injection of arsphenamine, 0.3 gram was given; for the second and third doses 0.6 gram. The patient was kept under close observation for untoward symptoms resulting from treatment and his general hygienic condition was looked after.

At the end of this course of treatment a blood Wassermann test was made, and if negative the patient was given a rest of three months. At the end of this time another Wassermann was made. If positive, a second course of arsphenamine and mercury was given, followed by the Wassermann test. If negative, a second three-month rest period was allowed. No patient was discharged as cured until he no longer presented any clinical evidence of disease and four successive blood Wassermann tests had been negative.

In searching through the records up to March, 1923, it was found that 187 syphilitic patients had been treated and discharged as cured. Practically all of this number were in the secondary stage of the disease when treatment was begun.

It was thought that it would prove an interesting study if a fair proportion of these discharged patients could be gathered in for a serological examination of their spinal fluids. From the list of those discharged 100 patients were induced to return for reexamination. In this group there were 52 men and 48 women. Each patient was given a neurological examination and a specimen of spinal fluid was obtained. The spinal fluid was examined for its Wassermann reaction, globulin content, and cell count.

All those examined in this series were negroes, the average age being 45 years. All were in the secondary stage of syphilis when treatment was begun. None had had less than one course of treatment and some had had as many as four courses. Each individual in this series had had four successive negative blood Wassermann tests previous to their discharge from treatment.

Results.—The spinal fluids of 16 of these hundred patients (8 men and 8 women) gave a positive Wassermann reaction. In 4 of these 16 there was a moderate pleocytosis and increased globulin content; 12 of the 16 presented definite clinical symptoms of syphilis of the nervous system. The remaining 4 were asymptomatic. Of these 12 patients presenting clinical symptoms there were 7 men and 5 women.

As to the amount of treatment received by these 16 patients, 9 had received only one course, 5 had received two courses, 1 had received three courses, and 1 four courses.

Of those 12 showing clinical symptoms, 8 had received one course of treatment, 3 had received two courses, and 1 three courses.

Comment.—It was thought that the presentation of this report would be interesting for several reasons. All of these patients were negroes, natives of the island of St. Croix. All lived under about the same general climatic, hygienic, and dietetic influences, and all were of the same rather low degree of intelligence. All these patients were in the secondary stage of the disease at time of admission. The patients examined were not selected cases, but were all that could be obtained from the list of those discharged from treatment.

Keidel¹ states that in the syphilis department of the Johns Hopkins Hospital a total of 42.6 per cent of all patients with late-acquired syphilis are actively neurosyphilitic on admission. J. E. Moore² giving his observations on a series of 642 syphilitic patients who had received from two to six months' treatment, states that after the appearance of secondary symptoms, the incidence of abnormal spinal fluid findings was from 12 to 15 per cent. Magnus³ says that in his own series of 232 syphilitics, the majority of whom had received some antisyphilitic treatment, he found 20 per cent to have some form of neurosyphilis.

It is regrettable that serological examinations of the spinal fluids of cases treated on this island were not made at the time of admission. Many authorities state that the Negro race is peculiarly immune to syphilitic attacks upon the nervous system. However, a total of 16 per cent of 100 cases that have received more or less intensive treatment, and whose blood Wassermann had been negative for four successive examinations, makes one wonder if this immunity is not more apparent than real. It is also stated by numerous observers that women are much less likely to develop neurosyphilis than men. In this series there were 52 men and 48 women. Of the 16 having evidence of neurosyphilis there were 8 men and 8 women.

MYIASIS OF THE EAR.

By L. L. DAVIS, Lieutenant, Medical Corps, United States Navy.

The following cases of myiasis of the ear are reported on account of their comparative rarity and the great amount of damage that is done to the soft tissue in such cases unless immediate and proper treatment is instituted.

The infection with the screw worm (larvæ of the bluebottle fly) occurs in tropical and subtropical America. The fly lays her eggs

¹ Albert Keidel, M. D., Studies in asymptomatic neurosyphilis, Jour. Am. Med. Assoc., vol. 79, p. 874.

² Jour. Am. Med. Assoc., Mar. 19, 1921.

³ V. Magnus, Norsk Magazin for Lægevidenskaben, Christiania, p. 23, January, 1922.

in wounds or body orifices having an offensive discharge, and especially attacks men or animals who are living in the open. Many such cases of infection in the nose and ears have been reported, and with a high mortality rate due to involvement of the sinuses and meninges. Several treatments are recommended in different books, and several treatments were tried in the following cases before finding one which proved efficacious.

Case No. 1.—Pvt. P. D., United States Marine Corps, was referred from the marine barracks, rifle range, Santiago, Dominican Republic, to the field hospital, Santiago, Dominican Republic, on the morning of February 6, 1923, for examination of his right ear. He gave no history of having any previous severe pain or discharge from his ear. He had reported at sick call in December, 1922, for slight pain in his ear, but the pain stopped in two days after drops were put in his ear. In January he had slight pain in his ear but not sufficient to make him report for treatment. He probably had an inflammation of the external meatus.

At 4 p. m. on February 5, 1923, a fly had flown into his ear. It was removed in about 10 minutes by the Hospital Corpsman at the rifle range. At 2 a. m., February 6, 1923, he was awakened by pain in his ear. The pain steadily became worse. When he arrived at the hospital at 9 a. m. it was apparent that he was having intense pain. He complained of a boring pain and a sizzling noise in his ear.

Ear examination revealed the anterior half of the tympanum and the end of the malleus covered with small maggots about 1 millimeter in length. They had already penetrated the tympanum and were crawling in and out through a perforation in it.

Treatment.—The maggots could not be washed out with boric-acid solution. The patient was put to bed and mercuric bichloride solution 1/1,000 instilled in his ear every half hour and the ear irrigated every two hours with warm boric-acid solution. Fifty-two live larvæ had been washed out at 6 p. m., and no more could be seen on the tympanum at that time.

The next morning the patient was having the same symptoms as on the previous morning, and as many larvæ could be seen as at that time. The same treatment was used as on the previous day until 4 p. m. A 5 per cent solution of phenol and cottonseed oil was then substituted for the bichloride solution and used alternately every half hour during the night and the next morning. Forty-three live larvæ averaging 6 millimeters in length were washed from the ear on the 7th. A 10 per cent chloroform solution in milk was then instilled in the ear every half hour during the afternoon of the 8th and the patient kept lying with the affected ear up. This had very little effect on the symptoms and activity of the larvæ. Thirty-six

live larvæ 1 centimeter in length had been washed from the ear during the day. All landmarks of the tympanum had disappeared, the anterior inferior quadrant was absent, and what remained of the membrane appeared as a grayish jellylike mass.

As the treatment used had not killed the worms and they were growing rapidly and going deeper into the ear, a 50 per cent solution of chloroform in milk was instilled at 6 p. m., on the 8th. In 10 minutes all symptoms had stopped. The next morning 55 dead larvæ and 1 live one were washed from the ear. The 50 per cent solution of chloroform was again instilled and 4 more larvæ obtained. There were no more symptoms and convalescence was rapid. A total of 190 worms had been counted.

Ear examination two weeks later revealed a large depressed trabeculated scar in the anterior inferior quadrant with reddish radiations in all directions from the malleus. Hearing was 10/15 in the right ear.

Case No. 2.—Sergt. H. J. Mc., United States Marine Corps, was referred from the marine barracks, rifle range, Santiago, Dominican Republic, to the field hospital, Santiago, Dominican Republic, on February 14, 1923, for ear examination. He had noticed a slight watery discharge from his left ear occasionally for the past month. He had no trouble with his hearing and gave no history of previous ear trouble.

A fly had flown into his ear at 3 p. m., the previous day but had immediately flown out again. His ear began to pain about 11 p. m. He could not sleep and the pain grew steadily worse. At the time of his arrival at the hospital he complained of stabbing pains and a sizzling noise in his left ear.

Examination of his ear revealed many larvæ in the external canal and on the tympanum. They could be seen disappearing and reappearing through a perforation in the membrane. The maggots were especially numerous on the posterior half of the tympanum.

Treatment was begun at 10 a. m., 11 hours after the symptoms had started. A 10 per cent solution of chloroform in milk was instilled in the ear every half hour. This stopped the symptoms for 10 minutes, and during this time the larvæ could be seen alive but inactive. However, very few could be washed out. This treatment was continued until 3 p. m. The ear was filled with mineral oil, but it had no effect. A 50 per cent solution of chloroform was then instilled. All symptoms subsided. Many dead larvæ were washed from the ear. The next morning the patient stated that it felt as though one maggot was still moving in his ear. After another installation of 50 per cent chloroform the symptoms did not return. A large ragged perforation was present in the posterior half of the

tympanum. Two days later the perforation appeared almost closed by granulations, and one week later only a lusterless scar remained. Hearing was normal.

The larvæ in both cases had 12 segments and around each segment was a circlet of spines. An effort was made to hatch out the maggots but they all died in the pupa stage. It is thought that they were from the *Crysomyia macellaria*.

Comment.—Oil, 5 per cent phenol, bichloride solution, and 10 per cent chloroform solution failed to kill the larvæ.

A 50 per cent solution of chloroform is an effective remedy.

NOTES AND COMMENTS.

The fumigation of ships by hydrocyanic acid gas has been enthusiastically advocated and practiced by port health authorities in the United States and in England, but the occurrence in both these countries of fatal accidents during the process has prevented the universal adoption of this method. In the *Lancet* of June 16, Dr. G. R. Seager Thomas published the post-mortem findings in two fatal cases which occurred in July, 1922, at Southampton. In these cases the outstanding features common to both were an absence of smell of HCN before opening the body and the absence of this smell from the urine; gaseous distention of the peritoneal cavity and of the intestines; the smell of HCN in all serious cavities; a strong odor of HCN in the lateral ventricles; intense lividity of the face and neck; gastric and intestinal mucosa bright pink; uniform blue-green color of the liver and a green color of the gray matter of the brain; chemosis and injection of the conjunctivæ, which were deep pink in color; lividity and engorgement of the buccal, pharyngeal, esophageal, and respiratory mucous membranes, positive chemical and spectroscopic tests. The report of these two cases is of interest in view of the comparative paucity of definite information at present available on the subject in medical literature.

In a recent number of the *Journal of Hygiene* we are informed by a writer in the same issue of the *Lancet*, Lieut. Col. W. G. Liston, I. M. S., and Mr. S. N. Goré compare the results of fumigation with HCN gas in a series of experiments on a ship using alternately the "dumping fixture" recommended by the United States Public Health Service and Liston's "cyanide fumigator." The characteristics of these two forms of apparatus are briefly described in the *Lancet*.

"The dumping fixture has been employed extensively in the United States. It consists of a barrel, to the upper edge of which one or two boxes are fixed on hinges. The barrel serves to hold a strong solution of H_2SO_4 , while the boxes are filled with NaCN . The contents of the boxes can be tilted into the acid when desired by drawing upon cords adjusted for the purpose. The HCN gas is generated in this way. No special arrangement is made to distribute the gas, and the quantity evolved depends on the quantity and quality of the NaCN used. The concentration of the poison gas present in the space under treatment is not estimated at any stage in the process,

and no means are provided for getting rid of the poison after it has accomplished its work other than the natural ventilation existing on the ship.

"Liston's cyanide fumigator is a more elaborate apparatus. The gas is generated in a closed box which can be placed in the open air. On the lid of the box a petrol motor, a fan, and a chemical cabinet are fixed. The motor is capable of revolving the fan at a speed of 3,600 revolutions per minute, and at this speed it can draw into the generating box through an inlet pipe 6 inches in diameter and deliver through an outlet pipe of the same diameter 1,200 cubic feet of air per minute at a pressure of 6 inches on a water gauge. The apparatus and chemicals required for generating, measuring, and testing the poison gas are contained in the chemical cabinet. The gas is evolved within the generating box by allowing a solution of sodium cyanide to mix with a solution of sulphuric acid on a mixing platform within the box. The quantity of poison gas evolved is regulated by the rate of flow of the two liquids upon the mixing platform; this rate is controlled by two screw clamps fixed on the rubber tubing which conducts the fluids from the vessels in the chemical cabinet into the generating box. When the motor is working the poison gas is diluted as rapidly as it is generated with air drawn by the fan from the compartment under treatment through the inlet pipe connecting the generating box with the compartment. The poison gas diluted in this way is at once blown back by the fan along an outlet pipe connecting the fan and generating with the compartment. The outlet pipe extends into the compartment for a considerable distance; it is furnished with a number of branches of gradually decreasing diameter, so that the diluted gas is carried to the remotest parts of the compartment and delivered there at from 8 to 10 different points. These points may be selected on the various decks of the ship. The air and poison gas within the compartment are thus continuously circulated through the generating box, where more poison gas can be added at will up to the concentration required to destroy rats, bugs, fleas, or other vermin. The concentration of poison gas in the air circulating through the machine can be estimated at any time by stopping the generation of the gas for a few minutes, while a measured volume of the air mixed with poison gas is taken either from the outlet pipe from the fan or, by making special arrangements, from any part of the compartment under treatment. The apparatus and chemicals for this purpose are provided in the chemical cabinet fixed to the machine.

"Liston's fumigator," says the writer, "thus differs from the dumping fixture in that (1) the poison gas, on generation, is rapidly

diluted with air, so that high concentrations are avoided; (2) the evolution of the gas is constantly under control during the whole period of fumigation; (3) the concentration of gas within the room can be estimated at any time; (4) the distribution of gas in the compartment is rendered more rapid and even by mechanical means; (5) the gas can be displaced by fresh air when its work is accomplished, a system of artificial ventilation assisting the natural ventilation of the ship. The machines are portable and can be carried by two men. Each is equipped to deal with 60,000 cubic feet of space at one time, so that a number of machines or units are required for the fumigation of a ship; the units should be used simultaneously, so that the whole ship is fumigated at one time. The period required for completing the process is from three to four hours. A port health officer should be provided with at least 10 units or machines.

"The experiments detailed by the authors in their paper demonstrate the defects and dangers of the dumping fixture and the advantages, noted above, which are to be derived from the use of the fumigator. For instance, while 7 pounds of sodium cyanide scarcely sufficed to kill all rats when the dumping fixture was employed, 6 pounds were sufficient to kill all rats with the fumigator. The use of the fumigator probably insures greater safety, first, because the poison gas is generated in the open air; secondly, because its rapid dilution prevents the occurrence of pockets of poison gas in high concentrations. With the fumigator, economy in the use of cyanide and acid effects a saving which goes far to cover the greater primary outlay and running expenses, as against the smaller cost and maintenance charges of the dumping fixture. On the grounds of safety and efficiency, therefore, it seems possible that Liston's cyanide fumigator may replace the dumping fixture in the fumigation of ships by hydrocyanic acid gas."

Referring to the spirit and scope of modern medicine in a review of the work of the Rockefeller Foundation in 1922, George E. Vincent, the president of that institution says:

"Mere personal opinion and unverified assertion have no place in modern medicine. * * *

"The spirit of modern medicine is scientific; it seeks to be open-minded toward new truth, provided this can be rationally related to the great body of firmly established and organized knowledge about nature, life, and mind, about which all scientific men agree. Scientific medicine can not accept ideas which are merely mystical or imply unknown and unverifiable physical or chemical properties, or invoke supernatural intervention, or are in other ways clearly fantastic or beyond the reach of any available demonstration or experi-

ment. So also modern medicine refuses to be labeled with the name of any school or cult. It is committed to no 'pathy'; it knows no panacea; it is prejudiced only in favor of conclusions drawn by soundly reasoned processes from exact and verified facts. It recognizes the intricacy of its problems; it realizes that only a beginning has been made; it does not hesitate to admit ignorance or to suspend judgment. Its constant aim is the discovery of truth and its application to human need. These ideas, it must be admitted, are the conscious principles of a relatively small number of the medical men of the world. But the modern scientific spirit is permeating the great body of practitioners, who have in the past too much relied upon dogmatic diagnosis, rule-of-thumb, 'shotgun' prescriptions, and a cheerful bedside manner. The personality and attitude of the physician toward his patients ought to be important sources of power and success, but they should supplement rather than take the place of the scientific method and spirit.

"The scope of modern medicine is as wide as the range of influences, physical, biological, mental, and social, which affect health. It has been asserted with some reason that in its preoccupation with the diseases of the body scientific medicine has too much neglected the psychic and social factors. The rapid spread of cults which invoke various forms of mental suggestion is probably due in some measure to the failure of modern medicine to include in its scope the relations of physical and mental states, to study these in a scientific spirit, and to utilize the healing powers of rationally controlled suggestion. * * *

"Perhaps the most important and significant extension of the scope of modern medicine is into the field of prevention by providing immunity through vaccination against many communicable maladies, by cooperating largely with public health authorities, by insisting on frequent examinations to detect incipient defects and diseases, and most of all by urging conformity to the laws of personal hygiene and the seeking of positive, vigorous, abounding health."

In the *Journal of Tropical Medicine and Hygiene* for June 1, 1923, we note that, according to Feldman and Ochs, who recently contributed a paper on "Potassium permanganate as a curative agent in dermatologic disease" to the *Archives of Dermatology and Syphilology*, potassium permanganate has yielded better results in the treatment of epidermophytosis, which is so prevalent in the Tropics, than any drug or combination of drugs hitherto employed. It can be used in strengths ranging from 1 in 5,000 to the full saturated solution, the former in early, moist, and irritated lesions, the latter in those associated with deep infiltration and lichenification.

Cases of intertrigo of the mammary folds and on the upper thighs yield readily to very dilute solutions (1 in 5,000), while in the intertrigenous type of epidermophytosis occurring between the fingers and toes stronger solutions may be employed with equally good results.

Unmistakable results are obtained in eczema marginatum by wet dressings and in old lesions by paintings with strong solutions of the drug. Patches situated on the flat surface of the body are occasionally resistant to treatment.

In eczematoid ringworm far better results are obtained by this method of treatment than is seen with the use of Whitfield's ointment. These cases require a longer period of treatment in order to obtain a cure than those enumerated in the foregoing, and the treatment must be kept up a long time after the disappearance of the lesions in order to make the results permanent.

The dyshidrotic form is the most resistant to treatment, especially in the presence of deep-seated vesicles and a thickened epidermis. Even here good results are obtained after the lesions are prepared by some keratolytic agent.

That all observers are not in accord with Feldman and Ochs is indicated by an article contributed by M. B. Hutchings to the Archives of Dermatology and Syphilology for December, 1922, on "Epidermophytosis of the feet," in which he says salicylic acid is the best agent for this purpose. Aside from the use of an ointment of ammoniated mercury in secondary pus cases, where it is specific, greasy applications, particularly in the daytime, are not only uncomfortable but ruinous to the shoes. Dyes, from tincture of iodine through the list, are disagreeable and of doubtful efficacy.

All vesicles must be broken up, all bullæ or lakes buttonholed, loose epidermis removed, soap and water freely used, and salicylic acid, from 12 to 100 per cent, employed as a peeling agent. Powders in socks, shoes, and slippers have constituted regular treatment, whether salicylic sulphur or talcum powder; this at present seeming the more effective, salicylic and sulphur equal parts, or occasionally the salicylic alone. Salicylic acid beneath air-tight adhesive is used for the removal of callosities.

If greasy applications are needed at night, Whitfield's ointment or a salicylic-sulphur ointment or simple petrolatum is used. Ointment of ammoniated mercury seems ineffective against these fungi. Cases extending over two years are reported.

From the British Medical Journal of June 9 we learn that Dr. J. S. Haldane, F. R. S., who is director of the Mining Research Laboratory at Birmingham, has communicated to the Royal Society a

paper by Mr. K. N. Moss on some observations made in that laboratory on the effects of high temperature and muscular exertion upon colliers. They relate to the consumption of food and of oxygen, and to certain results of the profuse sweating induced. The mean daily energy value of the food consumed by the colliers investigated was 4,712 calories. Men working in hot mines consumed more food, and a larger proportion of salted food, than men working in cool mines. The oxygen consumption per minute in various kinds of work at the face by an efficient collier varied from about 1,300 cubic centimeters to 2,000 cubic centimeters. In persons not acclimatized to heat the maximum amount of sweat lost per hour was about 1.4 pounds, whereas in a collier accustomed to work in a hot place the maximum loss was $5\frac{1}{2}$ pounds. The actual loss per shift was obtained for a number of colliers. The sweat was found to contain about 0.2 per cent of chloride, and the loss of chloride during a shift was very considerable. Men working in hot mines, at iron furnaces under certain conditions, and as stokers in ships, especially in the Tropics, suffer greatly from a sensation of thirst, which appears to be in part due to a physical drying of the mucous membranes of the mouth and throat. They are therefore induced to take large quantities of water—so large as to be in excess of the real requirements of the body. They are subject to attacks of cramp, which they speak of as miners' cramp or stokers' cramp. The cramp is referred by the author and Doctor Haldane to a form of water poisoning of the muscles brought about by the combination of great loss of chloride by sweating, excessive drinking of water, and temporary paralysis of renal excretion.

Curious accidents occurring in the naval service are always of interest. Recently at the dispensary of a large navy yard a Hospital Corpsman received a serious injury of an eye while in the act of opening a tube of ethyl nitrate for the purpose of making spiritus etheris nitrosi. The tube of nitrous ether was taken from the refrigerator where it had been kept for about six months; a towel was wrapped around the corrugated paper containing the tube, leaving a small portion of the neck of the tube exposed; three gentle strokes of a file were made against the neck of the tube when it exploded. The force of the explosion was sufficiently great to drive a fragment of the tube through the cornea of the Hospital Corpsman's left eye. The yard chemist found nothing amiss with a similar tube of ethyl nitrite except that its contents were slightly yellow in color.

A ship's cook attached to H. M. S. *Constance* recently lost his life on board that vessel under peculiar circumstances. It appears that

he was baking bread for the first time in that ship's bakery. With another cook he set bread to rise in three batches at 6.30, 7.30, and 10.30 p. m., intending to bake in the early morning when the bread had risen. In order to keep a constant temperature the hatches and ports were closed tight. After the last batch of dough was set, the two men turned in in their hammocks in the bakery contrary to orders. In the morning one of them was found dead and the other unconscious. The board of inquest found that the death had occurred through asphyxiation by carbon dioxide generated in the masses of rising dough.

The Navy Department has decided that it has been fully established that it is not necessary that an individual in the naval service be on active duty at the time his death occurred in order to warrant the holding of line of duty. But when his death has occurred after he has been placed on the retired list of the Navy, and while he is not on active duty, it is held necessary that the records show that his death was caused by some incident originating while on active duty, before a holding of line of duty is warranted. For example, if a retired officer, while going about his private affairs, had been struck by lightning or killed in some other manner wholly disconnected with the naval service or had died as a result of some disease not due to prior service conditions, his death should not be held to have occurred in the line of duty. Where, however, it is shown by the records of the Navy Department that his death was due to a disability, not the result of his own misconduct, originating while in active service, it is considered that his death is the result of an incident of the service and therefore in the line of duty.

The National Safety News of July, 1923, commenting on the safety records made at navy yards, says:

"Uncle Sam's marine defense men made an unusual safety record in the 16 larger yards and stations from July, 1922, to April, 1923. The 31,544 men were so well supervised that they were able to attain a severity rate of 0.997, with only 7 serious accidents in a total of 707—3 deaths, 1 permanent disability, and 3 partial permanent disabilities.

"A large diversity of work is carried on by the Navy. Hours worked totaled slightly more than 40,000,000, and was spent in machine shops, sheet-metal shops, structural shops, woodworking shops, sail lofts, copper smithing, painting (presumably in shops and aboard ship with the use of scaffolds), foundries, the manufacture of ordnance materials, and many other classes of work both inside and outside of ships and piers. The safety work is under direction

of a safety engineer attached to the office of the Secretary of the Navy, who has other safety engineers under him at the various yards."

Average number of employees.....	31,544
Total number of hours actually worked by all employees.....	40,051,245
Number of accidents causing lost time beyond the day or shift during which injury was received.....	707
Number of days lost because of accidents.....	39,928.562
Frequency rate—number of accidents per 1,000,000 hours worked.....	17.652
Severity rate—number of days lost per 1,000 hours worked....	.997

To determine whether a small city, a town, or a rural area could be protected against malaria at a cost which the local population could afford, the International Health Board began in 1916, in cooperation with State and Federal authorities, a series of demonstrations in small towns in Arkansas and Mississippi. The net result of these experiments was so encouraging that for the season of 1920 widespread demonstrations were begun under the joint auspices of the local governments, State health departments, the United States Public Health Service, and the International Health Board. The program for 1922 included 34 county-wide malaria control demonstrations and 32 town demonstrations in 10 States. All the demonstrations have afforded cumulative proof that under normal conditions an average community can practically rid itself of malaria at a per capita cost of from 45 cents to \$1 per year. In addition the board conducted experiments in mosquito control by use of fish and by screening under a variety of conditions, and tested the curative and protective possibilities of quinine.

In the Public Health Report for March 9, 1923, appears an account of the use of creosote oil as a mosquito repellent. Observation that bridges in Yazoo County, Miss., constructed of timbers treated with creosote oil were free from *Anopheles* mosquitoes, while other bridges near by made of untreated timbers were resting places for many, lead Coogler to test the effect of this oil as a repellent in the poorly constructed tenant houses which can not be properly screened. The oil was applied in the quantity of 1 gallon to 420 square feet. Observations made 10 weeks after application seemed to indicate that the creosote was still active.

The colored people who live in this type of house do not object to the application, no ill effects were noted, and it is certainly preferable to the smudges of rags, leather, and feathers so universally used by these people to keep the mosquitoes away while they sleep.

The work of the Rockefeller Foundation lies largely in the field of international hygiene. The following remarks on the promotion of international hygiene are quoted from the president's review of the activities of the Rockefeller Foundation during 1922:

"The most significant development in this movement is the recent creation under the League of Nations of a health organization, which has the direct support of 52 nations and the sympathetic co-operation of the United States. The new body has reached a working agreement with the International Office of Hygiene in Paris, and will doubtless have cordial relations with the International Sanitary Bureau. The program of the league's health organization includes the gathering of vital statistics, prompt notification of epidemics, standardizing of vaccines and sera, international conferences and exchanges of health officers, securing of better health conditions for sailors on shipboard and in ports, cooperation with league mandatories, with the Commission on Opium, and with the International Labor Office.

"The International Health Board has made appropriations to the league of \$344,440, to be used over a period of three to five years in a demonstration of the feasibility and value of an international epidemiological service and an international exchange of health officers. The first of these interchanges of health officers has taken place. Sanitary officials of Belgium, Bulgaria, Czechoslovakia, Italy, Yugoslavia, Poland, and Russia to the number of 21 met in Brussels October 8, 1922. After a series of lectures, conferences, and demonstrations the officers visited various health districts in Belgium. Then they went to Italy, where a similar plan was carried out. The whole program lasted for about 10 weeks. It is expected that these interchanges between different countries will take place three or four times a year and will promote efficiency and a sense of professional comradeship across national boundaries.

"It must be owned that there is to-day a suggestion of irony in smooth phrases about cooperation, understanding, and good will among the nations. Suspicion, distrust, detraction, hatred, and threat of war are all too prevalent in the relations of the peoples of the world. Scientific comradeship and common tasks of hygiene seem almost negligible as bonds of unity. But the difficulty of a task is no excuse for not attempting it. Because it is not possible to predict the early dawn of a millennial peace, there is no good reason for not taking steps which seem to lead toward even a remote era when nations may substitute generous rivalry for deadly conflict. To stimulate world-wide research, to aid the diffusion of knowledge, to multiply personal contacts, to encourage cooperation in medical education and public health are the means by which the

Rockefeller Foundation seeks to be true to its chartered purpose, which is to promote, not the exclusive prosperity of any one nation, but 'the well-being of mankind throughout the world.'"

The relief of a disabling malady prevalent throughout areas inhabited by 900,000,000 people of the world is sufficiently important in itself. But the control of hookworm infection has another and even more significant value. It is an effective means of educating people in the meaning of public health work, and of persuading them to support more comprehensive measures for preventing other diseases as well. For the facts about hookworm disease are fairly simple and easy to understand. * * * Experience with antihookworm campaigns in many countries has proved that the disease can readily be used as a means of educating the public in the possibilities of preventive medicine.

In the year 1922 the International Health Board had a part in hookworm-control activities in 22 governmental areas in the United States, the West Indies, Central America, South America, and the Far East. Since 1911 the board has cooperated in 69 States and countries. In 54 control measures were carried out; in 15 others only surveys were made. The policy of the board in this work has been: (1) To undertake control measures only on the invitation of a government which (2) bore from the first at least a small part of the expense and agreed (3) to take on each year an increasing proportion of the cost until it finally (4) assumed entire responsibility for the continuance of the project. In order to measure the progress of control the board in the last three years made reexaminations of school children in 66 counties in the Southern States and compared results with those of the original surveys, which were made between 1910 and 1914. On the average a reduction of 47.5 per cent was shown. In one county a decrease of 94 per cent had taken place; in several, over 80 per cent; in only one was an increase disclosed.

Simple and well understood as hookworm control may seem to be, the fact is that new knowledge is constantly leading to the adoption of new methods. The board's staff in the field constitutes in a true sense a body of research workers who are always on the alert for information and improved methods. From time to time experts are sent out to make special studies which throw new light on the problems of sanitation, treatment, and education. Important field studies in Trinidad and Porto Rico show that hookworm larvae can not travel far through the soil and do not live more than six weeks. This localizing of infection and self-sterilizing of the soil have a fundamental bearing on the problem of sanitation.

Outbreaks of illness following the consumption of cheese are of great rarity, says a writer in the *Nation's Health* for May 15, 1923.

An epidemic attributable to this cause was recorded in London in 1901, but the majority of outbreaks recorded have been in America. The main features of cheese poisoning resemble those of poisoning from other infected foods, but one or two minor points of difference are brought out by Dr. H. M. Cameron Macaulay in the *Lancet* in his study of an outbreak of cheese poisoning at Dover in July, 1922.

Doctor Macaulay does not find evidence of a single fatal case in any outbreak where the circumstances incriminating the cheese have been at all conclusive, whereas in other food-poisoning epidemics the case mortality is in the neighborhood of 1.5 per cent. Another point of difference is that the period of incubation appears to be shorter in cheese poisoning, and the usual food-poisoning organisms are hardly ever found in epidemics due to cheese.

The nature of cheese as a food affords an explanation for these differences. Cheese occupies the unique position of being practically the only article of food prepared many weeks or months before it is intended for consumption and not subjected to any process of preservation during that period. Moreover, bacterial action, so far from being inhibited, is encouraged along definite channels in order to bring about ripening.

This very fact makes it unlikely that in the event of a pathogenic organism being introduced in process of manufacture would remain alive at the time of consumption, the growth of the saprophytic bacteria and molds associated with the ripening process being unfavorable to the growth of the usual pathogenic organisms.

It is usual, therefore, in the rare instances when food poisoning has been attributed to cheese to find the Gaertner organisms present, a group almost invariably associated with an extremely stable toxin, capable of withstanding a temperature of 100° C. for five minutes. Care was taken to exclude the food handlers as carriers. Cheese poisoning, therefore, Doctor Macaulay considers to be a pure intoxication and infection with Gaertner organisms.

Dental officers will be interested in the following note contributed by the Navy Dental School:

The use of the Howe silver-reduction method for the sterilization of root canals is occasionally followed by severe pain of many hours' duration which dressings placed in the canals seem unable to alleviate. This pain is no doubt caused by the presence of the solutions in the apical area. Indeed, such severe pain often results that extraction is resorted to for relief. Prevention is better than a cure.

The silver solution should never be pumped in the canals with a broach, preferably carried a little distance into the canals with glass pipettes or gelatin tips and permitted to find its way to all diseased tissue by diffusion, allowing as long as 30 minutes to insure thorough penetration before adding the formalin. All excess formalin should be removed with cotton points and a dry point inserted as a dressing. Laboratory experiments indicate that the silver solution will penetrate wherever tissue disintegration has occurred to but not through the apex unless force is used. When severe pain follows the use of this treatment it is recommended that an injection of novocain for anaesthesia be used, preferably conduction. This injection will, of course, immediately relieve the pain, and usually permanently; however, if it returns after the effect of the novocain wears off it is with much less severity. The use of this simple means will obviate the necessity of extraction for relief.

BOOK NOTICES.

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PRACTICAL BACTERIOLOGY, BLOOD WORK AND ANIMAL PARASITOLOGY, INCLUDING BACTERIOLOGICAL KEYS, ZOOLOGICAL TABLES, AND EXPLANATORY CLINICAL NOTES, by E. R. Stitt, A. B., Ph. G., M. D., Sc. D., LL. D., Rear Admiral, Medical Corps and Surgeon General, United States Navy. Seventh edition. P. Blakiston's Son & Co., Philadelphia, 1923.

This work needs no introduction to the naval medical officer or to the medical profession at large. The fact that seven editions have passed through the press in a few years testifies to its usefulness and popularity. The book has been noted for the large amount of practical information it presents in concise form. The new edition is similar in plan to those preceding it. In the revision the author has eliminated all material that has become obsolete or of questionable practical value and has added much to bring the book strictly up to date; as he states in the preface, "the advances in internal medicine during the two years that have elapsed since the appearance of the previous edition have made it necessary to increase the volume of the book by 132 pages." Many of the illustrations used in former editions have been replaced in this edition by others that are more instructive. A large number of new tables have been added, among which those dealing with the classification of mosquitoes and those giving the vitamine content and the constitution of various food-stuffs are noteworthy.

The importance of dietetic faults in the production of disease and in lowering the resistance of the body to bacterial invasion has become clearly recognized and it is pleasing to note that the author has inserted a summary of the subject of nutrition for the convenience of those who may not have ready access to recent literature dealing with this question.

In connection with the flocculation tests for syphilis, it is noted that the Sachs-Georgi, Meinicke's third modification, and the Kahn methods have been substituted for the less dependable modifications of the Wassermann test formerly described.

The Jansky classification of blood groups has been adopted in view of the recommendation of the special committee representing the American Association of Immunologists, the Society of American Bacteriologists, and the Association of Pathologists and Bacteriologists, but the author has retained the Moss classification used in former editions for the benefit of those preferring it.

The section on the Noguchi modification of the Wassermann reaction was prepared by Doctor Noguchi; Doctor McCoy, of the Public Health Service, has reviewed the "Bacteriology of water" and written the section on "Toxin and antitoxin unit"; Dr Edward Francis of the same service has prepared the paragraphs on *Bacterium tularensis*, indicating the care the author has taken to have the work authoritative.

NON-SURGICAL DRAINAGE OF THE GALL TRACT. A TREATISE CONCERNED WITH THE DIAGNOSIS AND TREATMENT OF CERTAIN DISEASES OF THE BILIARY AND ALLIED SYSTEMS, IN THEIR RELATION TO GASTRO-ENTEROLOGY AND GENERAL CLINICAL MEDICINE, by B. B. Vincent Lyon, A. B., M. D., chief of clinic, gastrointestinal department of the Jefferson Hospital; associate in medicine in the Jefferson Medical College, attending physician to the Methodist Episcopal Hospital, Philadelphia, Lea Febiger, Philadelphia, Pa., 1923.

Much of the advance in medical knowledge has been due to the discovery of technical methods of examination and treatment. In April, 1917, a paper was published by Dr. S. J. Meltzer, of the Rockefeller Institute, which carried at the end this footnote:

"In experiments with magnesium sulphate I observed that the local application of a 25 per cent solution of that salt on the mucosa (of the duodenum) causes a completely local relaxation of the intestinal wall. It does not exert such an effect when the salt is administered by mouth—that is, when it has to pass through the stomach before it reaches the intestines. The duodenal tube, however, apparently has reached an efficient practical stage. I make, therefore, the suggestion to test in jaundice and biliary colic the local application of a 25 per cent solution of magnesium sulphate by means of the duodenal tube. It may relax the sphincter of the common duct and permit the ejection of bile, and perhaps even permit the removal of a calculus of moderate size wedged in the duct in front of the papilla of Vater."

This observation was the basis of the practical method of drainage of the biliary tract by way of the duodenum evolved and described in various medical journals by the author of this book.

In the present volume the author outlines the fundamental principles upon which his method of approaching the diagnosis of gall-tract disease rests and the various steps necessary in the making of a more accurate diagnosis than has hitherto obtained. In this latter connection he emphasizes the importance of the fundamental value of a properly taken history and a properly conducted physical examination. He points out the great help in diagnosis that can be secured by observation of the bile as it is recovered by duodenobiliary tract drainage and he stresses the diagnostic inferences which can be secured by the cytology, bacteriology and physiological chemistry of the fluids obtained. He shows that by such study we can more perfectly and reliably establish the diagnosis of gall-tract disease, in certain cases, than by any other single method. He gives the technic of the method and discusses the usefulness of it as a means of treatment either alone or in combination with other procedures both medical and surgical in various types of cases.

In a review of a clinical study of 100 consecutive cases of gall-tract disease observed by him in his private practice, the author points out some of the lessons he has learned in regard to the importance of securing certain historical, physical, laboratory, and technical data as a necessity in properly diagnosing and classifying cases of gall-tract disease, with or without complications, as a first step in a decision for or against their management by surgical or nonsurgical methods; some of the lessons he has learned both for and against the therapeutic effectiveness of nonsurgical biliary drainage; his impressions of the effectiveness of surgical procedures as exemplified by the cases studied and his views as to future problems of biliary-tract disease which must be worked out.

The author's method of attacking the diagnostic and therapeutic problems of gall-tract disease is a distinct step toward the earlier and more complete recognition of disease in this locality, thus preventing late pathological conditions. Therapeutically it will supersede some of the dietetic and oral therapeutic measures which in the past have proved relatively unsuccessful, and when judiciously applied preoperatively and postoperatively will secure for the gall-tract patient a better chance of total recovery from the operation without danger of subsequent relapses. The author has successfully treated many border line cases, heretofore considered surgical, by this method.

The method has its limitations. It can not remove pathological tissue or gallstones. It can, however, materially aid the surgeon in the diagnosis of these conditions, and can prepare the operative field with increased safety to the patient.

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Where the cystic duct is patulous the method can drain the gall bladder as well as can be done by the surgeon.

Since this method of nonsurgically attacking gall-tract problems diagnostically and therapeutically was formerly presented in September, 1919, the author has published a series of paper (28) outlining the principles upon which this method is based and the technic which should be adhered to for safeguarding accurate differential diagnosis, emphasizing the need of earlier diagnosis of gall-tract disease, calling attention to the possibilities in the prevention of gallstones and late gall-tract pathology, and, finally, giving a classification and citation of cases which represent the groups of gall-bladder, gall-duct, and liver disease in which it has a proper field of practical therapeutics.

During the past three years this method has been carefully watched, freely discussed and criticized, and finally widely adopted. Most writers have confirmed the soundness of the principles upon which this method of diagnosis and treatment rests. Certain writers, however, as a result of their experimental observations, have attacked the very roots of the method, and the author devotes an illuminating chapter to the careful answering of published criticism of the method.

PATHOLOGICAL PHYSIOLOGY OF INTERNAL DISEASE, by *Albion Walter Hewlett, M. D., B. S., professor of medicine, Stanford Medical School.* Second edition. D. Appleton & Co., New York, 1923.

During recent years much progress has been made in the study of disease from the functional viewpoint. Advances in physiology, biochemistry, immunology, and experimental pathology, as well as the careful study of patients, have thrown new light upon many disturbances of function. To the physician these advances have been of increasing significance. Not only have they served to interpret the clinical pictures with which he comes in contact, but they have pointed the way to new diagnostic methods and have furnished new indications for treatment.

This book deals with those changes in function that are presented by patients suffering from internal diseases. In it the author discusses the functional pathology of the circulation, digestion and absorption, metabolism, the liver and pancreas, the disturbances of respiration, kidney function, heat regulation, the blood, the glands of internal secretion, and the nervous system. A chapter is devoted to the question of infection and immunity.

Since the first edition appeared in 1916 numerous additions to our knowledge of functional pathology have been made and the author has taken advantage of the revision to incorporate them in the text. This is especially noticeable in the sections which deal with the

cardiac arrhythmias, cyanosis, traumatic shock, metabolic rate, vitamins, respiratory disturbances, protein hypersensitiveness, acute hemorrhage, and the endocrine diseases. To the new edition a chapter on the functional aspects of organic nervous diseases has been added.

MEDICAL DIAGNOSIS FOR THE STUDENT AND PRACTITIONER, by *Charles Lyman Greene, M. D.*, formerly professor of medicine, University of Minnesota, and chief of the medical clinic in the university hospitals. Fifth edition. P. Blakiston's Son & Co., Philadelphia, 1922.

"A book on diagnosis which in subject matter and mode of presentation alike best serves the student must prove inevitably to be that most useful to the busy practitioner, inasmuch as every worthy physician remains a student in attitude and spirit, and relishes keenly any revival of his memories of the atmosphere of the classroom and the teaching words." So said the author in the preface of the fourth edition of this well-known book which appeared in 1917.

Over 30 years of service as a teacher of medical students can not fail to develop strong convictions with respect to the best mode of presentation, the proper placing of emphasis, and even of the value of repetition in relation to certain topics which present peculiar difficulties to the average student and practitioner alike. Possessing these convictions, in the preparation of the fifth edition, the author has expanded every section by important additions, and he has spared no effort to make the volume a thoroughly practical and up-to-date treatise upon modern medical diagnosis.

Among those sections which have been considerably amplified are those dealing with the heart and blood vessels and the marking and interpretation of the polygram. The sections dealing with electrocardiography and the cardiac arrhythmias have been very largely rewritten, and a great amount of new material evolved as the result of circulatory study during the World War has been included. Similarly the application of roentgenology to the diagnosis of cardiac disease has been extensively treated, and there have been added numerous roentgenograms illustrating cardiac abnormalities. In the section on myocardial overstrain one notes roentgenograms and venous pulse tracings which illustrate what may be discovered concerning this condition by the use of these diagnostic measures. The section on influenza has been revised and greatly expanded. To it has been added a series of roentgenograms illustrating hemorrhagic pneumonia of influenza, together with a quotation concerning the complication from the writings of John Hunter Selby.

An important innovation in the fifth edition is the "symptom index," which should be of great value to the reader. The numerous

illustrations throughout the volume are noteworthy. The book is large, containing nearly 1,500 pages, and it is extraordinarily complete.

ENLARGEMENT OF THE PROSTATE, by *John B. Deaver, M. D., LL. D., Sc. D., F. A. C. S., John Rea Barton professor of surgery, University of Pennsylvania, surgeon in chief to the Lankenau Hospital, Philadelphia, assisted by Leon Herman, B. S., M. D., urologist to the Methodist Episcopal Hospital, Philadelphia.* Second Edition. P. Blakiston's Son & Co., Philadelphia, Pa., 1923.

The work opens with an exceedingly readable historical sketch of the operative treatment of enlargement of the prostate, which is followed by excellent chapters on the anatomy and physiology of the gland. Speaking of the etiology and predetermining factors of benign prostatic hypertrophy, the author remarks that he is tempted to dismiss the subject of the etiology of this condition, as did that most experienced of all modern prostatectomists, Mr. Freyer, of London, by confessing our complete ignorance of the cause of the condition. In spite of much investigation very little has been added to our knowledge of the etiology of prostatic hypertrophy within the past 50 years; certainly the true cause or causes of the adenomatous form of the disease have not been demonstrated.

Any prostate weighing more than 23 grams may be considered abnormal. Enlargement of the prostate is almost invariably due to the development within the substance of the gland of adenomalike nodules. These nodules, which have a spongy appearance, though varying in density, are surrounded by a more or less complete capsule. The latter is composed of dense stroma with an admixture of muscle fibers. Microscopically the nodules are composed of newly formed glands together with an increased stroma, although the latter contributes but little to the actual size of the nodule. Enlargement of the prostate due to hyperplasia of the fibrous connective tissue and muscular elements in the absence of glandular increase is not unknown, but it is an extremely rare type of prostatic enlargement and must be differentiated from the sclerotic prostate due to inflammatory deposits, which frequently causes marked prostatism but for a different reason than applies to the enlarged adenomatous organ. In the case of the latter the nodules themselves offer an obstructive factor to urination by invading and distorting the lumen of the prostatic urethra and the bladder orifice. The sclerotic prostate interferes with urination by causing an actual contraction of these parts, and is often complicated by median bar formation at the vesical outlet. Obviously the treatment appropriate to these widely different forms of the disease is by no means the same—in one form the gland may be easily enucleable, while in the other the dense,

sclerotic mass is tightly adherent to the surrounding structures and is removed with great difficulty.

As the prostate gland enlarges, whether from tumor formation or as the result of a general hyperplastic process, various changes are produced in the urethra, the bladder, and the rectum; and less directly in the urine, the kidneys, and general health. These changes are clearly described in the chapter on the clinical pathology of the disease.

The subjective and objective symptoms of prostatic enlargement are ably commented upon. There is an admirable chapter on diagnosis and differential diagnosis, cystoscopic diagnosis, and the kidney functional tests. It has been the author's experience that the percentage elimination of phenolsulphonphthalein and the degree of urea retention in the blood are the most important criteria of kidney function. The normal kidneys may fail in the excretion of a normal amount of phthalein, but there will be no abnormal retention of urea in the blood of an individual whose kidneys are functioning normally. If a poor output of phthalein occurs in a prostatic whose blood urea remains normal with a diet containing ordinary amounts of proteids, little significance should be attributed to the low output of the dye.

In a chapter on prognosis the author takes up what may be accomplished by the various methods of treatment. He discusses the primary mortality following prostatectomy and certain factors concerned in mortality, the complications to be expected, and post-operative morbidity.

The latter half of the volume is devoted to a consideration of the treatment of enlargement of the prostate. In view of the results obtained by modern operative methods, the author advises against a trial of catheter life, as this procedure shortens life by promoting infection of the bladder and kidneys. It should be advised only in inoperable cases. However, as the catheter is indispensable in the diagnosis and treatment of prostatic enlargement, some pages are given up to a discussion of the different varieties of catheters and their sterilization and preservation. The method of passing a catheter and the prevention and treatment of complications attending the use of this instrument are dwelt upon.

For the treatment of certain desperate cases of enlarged prostate with acute retention in which almost any radical operative interference would be attended with grave danger various palliative operations have been devised. Among these may be mentioned the trochar and cannula method of Lower, of Cleveland; the formation of a bladder valve as devised by Gibson; the ordinary cystostomy and various intraurethral operations. Among the latter may be mentioned Young's punch operation or median bar excision, Chetwood's

galvanocautery operation, and the high-frequency spark operation introduced by Bugbee. These operations are described, and in this connection the author says, "The trend of modern surgery in the treatment of these cases is undoubtedly toward suprapubic operation notwithstanding the claims made by the advocates of the palliative forms of treatment."

In the treatment of the enlarged prostate, as in many surgical conditions, operative treatment has become gradually perfected to the point where radicalism has proved itself safer than any method of palliation, hence the author devotes a chapter to the indications for radical treatment by suprapubic and by perineal prostatectomy. The most recent development in the surgery of the prostate, namely, the two-stage operation, is believed by some to meet the requirements of a routine procedure, but to this the author takes exception, believing that this method of treatment should be selected only in a certain class of cases. For practical purposes he divides all operable cases into three groups, as follows: Group I comprises all patients in the initial stages of prostatism who present no complications necessitating preliminary treatment. In this group, if we are able to demonstrate a small quantity of residual urine in the absence of marked distention, inflammation or atony of the bladder wall; if the cystoscopic examination demonstrates sufficient prostatic obstruction at the vesical outlet to explain the presence of the residual urine; if the patient's vital organs are in good condition; if his kidney function is approximately normal, immediate operation is deemed not only safe but wise.

Group II, which comprises the great majority of patients with prostatic hypertrophy, includes all cases in which some form of preparatory treatment is necessary if the operation is to be undertaken with safety. Cases in this group are always moderately advanced in prostatism; the effects of urinary obstruction are evident, primarily in the bladder and the upper urinary tract and secondarily in the general effects of urinary stasis and in the systemic effects consequent upon a distressing affliction.

To attempt prostatectomy immediately in patients belonging to this group is to invite disaster. In the great majority of instances catheterism, either intermittent or continuous, together with the treatment appropriate to the complications present, will result in an improvement sufficient in degree to permit prostatectomy being attempted with every chance of success. The operation may be performed in one stage, but more often it should be done in two stages.

Group III includes those patients in whom for any reason palliative treatment is contraindicated and in whom immediate relief of urinary obstruction is a necessity. This group therefore includes

all patients whose condition demands removal of the prostate gland, but in whom instrumentation is impossible, and for this reason preliminary cystostomy is demanded.

After determining the advisability of prostatectomy in any given case we must next carry out preliminary treatment designed to get the patient in the best possible condition for operation. Having succeeded in this, we choose the method of operation best suited to the needs of the individual case. We have before us a choice of two routes of access to the prostate gland, the suprapubic and the perineal, and a number of variations in the operative procedure by either route. According to the author the preferable route for total enucleation of the prostate is the suprapubic. The perineal operation is best confined to those cases where the prostate is small, fibrous, and sclerosed; where the removal of the floor of the prostatic urethra and the main part of the lateral lobes of the prostate will lower the vesical orifice sufficiently to make a clear-water way; and where there is little chance of the only portion of the prostate left (the superior commissure) subsequently enlarging and causing renewed obstruction.

In the closing chapters of the book the author gives the technic of the various modern operations, including the preparation of the patient, and the after treatment.

The volume is replete with illustrations depicting the anatomy and pathology of the prostate gland and the details of the various steps in operative interference.

VENEREAL DISEASES IN THE AMERICAN EXPEDITIONARY FORCES, by *George Walker, M. D., late colonel, Medical Corps, U. S. A.* Medical Standard Book Co., Baltimore, Md., 1923.

The object of this book is to record the experiences of the American Expeditionary Forces in the control of venereal disease. In it the author discusses the methods which really proved effective and those which were found to be futile, and he has brought together a mass of data of great value to those interested in the prevention of venereal disease in all its various phases.

NURSERY GUIDE FOR MOTHERS AND NURSES, by *L. W. Sauer, M. A., M. D., senior attending pediatrician, Evanston Hospital.* C. V. Mosby Co., St. Louis, Mo., 1923.

This is an excellent small manual which considers in detail the care of the infant. There are chapters on the general care of the infant, the nursing infant, the premature infant, artificial feeding, nutritional disturbances of the artificially fed infant, some of the common ailments of children, and the care of the sick infant. The book is well written and illustrated.

APPLIED PSYCHOLOGY FOR NURSES, by *Donald A. Laird*, assistant professor of psychology, University of Wyoming. J. B. Lippincott Co., Philadelphia, Pa., 1923.

This little volume is an excellent addition to the series of nursing manuals published by the Lippincott Company. We are living in an age of applied science, and psychology is taking a place alongside of electricity, chemistry, and mathematics in the practical work of everyday life. In this book the author has attempted to select from the literature of psychology "those facts that will be of most immediate aid to nurses in understanding the patients, themselves, and their fellow men as organisms that act, think, and feel." The facts discussed are presented from the biological point of view.

The author treats his subject in four parts. Part 1, which is introductory, tells the reader what should be expected from psychology. The second part presents the biological foundations of behavior, while in the third part the more practical results of the biological adaptations of psychology are presented, such as gaining skill, skill in thought, the use of skill, temperament, use and abuse in thought, and the use of suggestion. The fourth portion of the book deals with certain aspects of mental hygiene with which every nurse should be familiar.

THE DIVISION OF PREVENTIVE MEDICINE.

Lieut. Commander G. E. PHILPS, Medical Corps, United States Navy, in charge.

Notes on Preventive Medicine for Medical Officers, United States Navy.

INSTRUCTIONS TO MEDICAL OFFICERS.

FURTHER REMARKS RELATIVE TO VACCINATION AGAINST SMALLPOX IN THE NAVY.

Perhaps medical officers may have an idea that this subject should not be discussed again without apology. It is true that existing regulations and instructions fully cover all questions likely to arise. It is also true that the Navy in general is well vaccinated; very few persons in the service escape vaccination and the great majority of all officers and enlisted men are known to possess immunity as evidenced by one or more pitted scars indicative of a previous primary take, further checked by a recent reaction of immunity.

Nevertheless, it is a reflection upon the Medical Corps of the Navy that the bureau should have to furnish the data presented below when asked by the International Health Board for the vaccination histories in 77 cases of smallpox recorded in the Report of the Surgeon General for the year 1922 as occurring in the Navy during the preceding year.

The International Health Board and many other unofficial health agencies as well as Federal, State, and local health organizations are constantly forced to defend vaccination in seeking to secure legislation or prevent the enactment of laws inimical to the public health as urged by persons and cults opposed to compulsory vaccination. Inasmuch as the Navy is supposed to be completely vaccinated the incidence of the disease looked bad, and doubtless those interested will be relieved to know that persons who oppose protection against smallpox can not find consolation in the figures. But, on the other hand, the figures are certainly not a credit to the Medical Department of the Navy.

The bureau is aware of the difficulties presented by ever-shifting personnel and the sudden transfer of large drafts from receiving ships or stations and occasionally from ships, but the Navy can be

insured against all but residual cases of smallpox that may occur after exposure in rare instances as a result of vagaries of immunity in the exceptional individual.

Such insurance can be kept up only if each and every medical officer who examines naval personnel before or after transfer, or is responsible for health conditions on board ship or at a naval station, sees to it that the vaccination status of each man is checked up by himself or with equal thoroughness by a junior medical officer as a matter of routine and in such a systematized manner that omissions and mistakes can not occur.

The use of a rubber stamp in place of the written signature is pernicious, and it is not to be expected that a conscientious medical officer before whom the health record and the man later pass for review will place any credence whatever upon a stamped entry. The medical officer who actually saw the result of vaccination is the only person in a position to record an immunity reaction or a positive "take." The entry of a negative result means nothing except that vaccination must be repeated with fresh virus. The time for recording the result of vaccination is immediately after reading the result. This plan requires little or no extra time. The medical officer can sit at his desk and study each man's arm as he appears and presents his health record, which has been handed to him by a hospital corpsman.

The use of typewritten lists of the names of men who have been vaccinated introduces an unnecessary and a weak link in the chain of evidence. Many mistakes have been made in copying results from such lists into health records.

Even when the medical officer has initialed the stamped entry the use of the stamp still suggests that someone else did the work, or the copying, and that the medical officer did not as a matter of fact know or remember for himself that the result was as recorded in the particular case.

Many instances of obviously incorrect entries initialed by medical officers have been reported to the bureau by other medical officers. The cases in which a positive result has been recorded but no pitted scar remains as evidence and the man himself states frankly that it did not take, have about balanced the number of cases in which the result has been recorded as negative while the man indignantly protested that it did take and he was able to show a pitted scar more or less recent in origin.

Often the obviously incorrect entry has been made at a naval training station and initialed by the senior medical officer. Some other medical officer probably saw the result; he should have recorded it at the time he made his reading.

The first question to be settled in determining whether a man is probably now immune to smallpox is, "Has he ever had a primary take?" This question is not to be answered by looking in the man's health record. He and his health record should be examined together. Perhaps a majority of all men now enlisting in the Navy present typical outstanding pitted scars indicative of a primary take before entering a public school. Others have had the primary take at a naval training station. Occasionally a primary take results from vaccination on board a cruising ship. That in itself indicates dereliction of duty somewhere along the line before the man was transferred. Among the older men, especially, there are often found two or more finer pitted scars in addition to that of the primary take indicative of accelerated reactions at varying intervals, which, while furnishing evidence of reimmunization also indicate that the individual lost immunity after his first vaccination and thus in general serve as reminders that it can not be taken for granted that protection will necessarily last for a prolonged period.

The immunity test causes no discomfort and it is so simple that there can be no excuse for failure to test every man who has not had an immunity reaction or an accelerated take within the year.

Of those who present the typical scar resulting from a primary take, even though it took place several years before enlistment, 95 to 98 per cent can be expected to give an immunity reaction of marked degree, appearing in from 10 to 24 hours, showing at the end of 24 hours a definite area of redness, elevated a little, and sufficiently indurated so that it can be distinctly differentiated from a control made by similarly traumatizing another area on the arm without inoculating the virus. The lesion itches slightly, and sometimes there is a very little soreness in the vicinity. The reaction is at its height in some cases at the end of 24 hours, and in some not until after 36 or 48 hours. From this time on the color gradually fades, but it may still be recognizable after a week or longer period.

If there is little or no immunity left when the test is made either a very slight reaction occurs or no change is seen at the site of inoculation, other than that caused by the pricking of the needle or scratch, at the end of 24 or 36 hours. Later a vesicle may form, the size and rapidity of evolution into a small scab depending upon the degree of immunity still possessed by the individual. If there is no immunity the size of the lesion, zone of redness, typical formation and appearance of the vesicle, and increased duration of the different stages progressing to scab formation will approximate the conditions of a primary take, but never reach the same intensity. On the other hand, with a slight degree of protection remaining, but not enough to give a typical reaction of immunity, the accelerated reaction may be so mild that it can not be differentiated from a

delayed immunity reaction. Finally, from 1 to 2 per cent of the men may fail to show any reaction whatever even when repeatedly tested with different lots of fresh refrigerated vaccine. In about half of such cases a pitted scar indicative of successful vaccination several years previously will be found, and in about half no evidence of a take can be found, in spite of repeated efforts to vaccinate at intervals for several years, as recorded in the health record. A small number of the men, especially Filipinos, who fail to give a reaction of immunity will be found to have had smallpox and to have been vaccinated without success before and after infection. It may be that such individuals do not develop intense immunity in reacting to the modified cowpox virus, and that they do not hold their acquired immunity long after recovery from infection with smallpox, but have enough to destroy without visible reaction the minute quantity of cowpox virus used in the test and thus prevent the cowpox lesion from developing. Persons who fail to react will probably become infected with smallpox if heavily exposed, and they probably can not be protected with commercial cowpox vaccine inoculated in the ordinary manner. They form such a small percentage of the crew that record can easily be kept of them and they can be sent for and placed under observation whenever there is danger of the introduction of smallpox.

Controversy not infrequently arises over the method to be used in vaccinating. Multiple puncture or pricking into the true skin through a drop of virus, using the sharp round needle that is furnished with the capillary tube containing the virus, certainly results in clear, sharply defined immunity reactions, and the injury to the skin is so slight that fine comparison can be made between the test and an equal degree of traumatism caused by pricking through a drop of sterile salt solution in a neighboring area, used as a control. The needles may be saved and a large number sterilized in getting ready for a long line of men. One needle can be used for each man by first pricking in the control and after that the test through a drop of virus.

The question arises, Will the minute quantity of virus inoculated by the puncture method result in a sufficiently active take to furnish protection against smallpox in case the subject is susceptible? This method not infrequently results in perfectly typical large vesicle and pustule formation with an extensive area of redness and brawny induration in persons never before successfully vaccinated. On the other hand, we know from all the experience of the past that scarification is effective, and that it is not necessary to scarify over a large area and thus leave a large and unsightly scar or invite secondary infection. Except at training stations the great majority of men to

be tested for immunity will show typical pitted scars, and four or five oblique pricks into the skin will result in a satisfactory reaction of immunity. In cases where there is no evidence of a previous take it may be well to use in addition to the routine test for immunity a technic that will introduce a greater quantity of virus at another site.

Inspection of a large number of arms and health records together indicates that there are still a number of medical officers who are not familiar with the reaction of immunity. In many instances the result of vaccination has been recorded as "positive" (a bad term to use now) or as "accelerated" when no scar whatever resulted, and upon testing for immunity the man has declared the reaction to be exactly like the result previously recorded as positive. In other words, many marked reactions of immunity have been recorded as takes, and it would therefore appear that the medical officer did not know the reaction when he saw it.

Cowpox virus is now known to deteriorate so rapidly at temperatures above 32° F. and precautions to preserve it are so important that repeated mention is justified. Deterioration is bound to occur when sent long distances through the mail. This is not always unavoidable, but the medical officer can at least see that the virus is placed in the cold-storage room, where the temperature is below the freezing point, immediately after it is received. Deterioration will continue in a refrigerator unless the vaccine is put into a double container packed with ice and salt.

The following table contains the vaccination data relating to 62 of the 77 cases of smallpox which occurred in the Navy during the calendar year 1921. The health records of the remaining 15 men have not yet reached the bureau. It is evident that these men as a group were not thoroughly vaccinated.

Case.	Date of onset.	Where developed.	Number of scars prior to enlistment.	Number of positive takes.	Immunity reactions.	Negative.	Remarks.
1.	Jan. 12, 1921	Marine barracks, Paris Island, S. C.	0	0	0	{Nov. 28, 1919 Dec. 9, 1919 Dec. 16, 1919 Oct. 7, 1920 Oct. 20, 1920}	Enlisted Dec. 28, 1920.
2.	Jan. 13, 1921	Training station, Great Lakes, Ill.	0	0	0	0	
3.	Jan. 9, 1921	do.	0	0	0	0	
4.	Jan. 24, 1921	do.	0	0	0	0	
5.	Jan. 23, 1921	U. S. S. Melville.	1	Dec. 9, 1920	0	0	
6.	Jan. 25, 1921	Training station, Great Lakes, Ill.	0	0	0	{Dec. 6, 1920 Dec. 12, 1920 Dec. 7, 1920 June 11, 1917 Aug. 12, 1920 (Trans.) Aug. 14, 1920}	Died Mar. 3, 1921.
7.	Jan. 3, 1921	do.	0	0	0	0	
8.	Feb. 28, 1921	U. S. S. Overton.	0	0	0	0	
9.	Jan. 22, 1921	Training station, Great Lakes, Ill.	1	Oct. 30, 1920	0	{Feb. 21, 1919 Feb. 26, 1919 Aug. 6, 1920 Feb. 15, 1921}	
10.	Feb. 15, 1921	U. S. S. Mississippi.	0	0	0	0	
11.	Feb. 16, 1921	do.	0	{Sept. 11, 1919 Feb. 15, 1921}	0	0	
12.	Mar. 1, 1921	do.	0	Sept. 11, 1919	0	{Feb. 15, 1922 Aug. 1, 1919 Aug. 7, 1919 Aug. 15, 1919 Feb. 16, 1921}	
13.	Mar. 1, 1921	do.	0	0	May 4, 1921	0	
14.	Jan. 9, 1921	Naval station, Guantanamo Bay, Cuba.	1	{Sept. 4, 1919 Dec. 12, 1920}	0	0	
15.	Jan. 20, 1921	Training station, Great Lakes, Ill.	0	Dec. 6, 1920	0	0	Patient affirms he never had a positive take.
16.	Jan. 25, 1921	do.	0	Dec. 7, 1920	0	0	
17.	Jan. 21, 1921	do.	0	Dec. 26, 1920	0	0	
18.	Feb. 17, 1921	U. S. S. Mississippi.	0	Sept. 24, 1919	0	{Sept. 11, 1919 Aug. 3, 1914 Mar. 30, 1918 June 27, 1918 Nov. 3, 1919 Feb. 16, 1921 Nov. 1, 1920 Feb. 12, 1921 Sept. 15, 1921}	
19.	Mar. 15, 1921	U. S. S. Fishhawk.	1	June 16, 1914	0	0	
20.	Sept. 5, 1921	U. S. S. Huron.	1	{Feb. 21, 1919 Apr. 25, 1920}	0	0	
21.	Feb. 18, 1921	U. S. S. Mississippi.	1	May 8, 1919	May 10, 1921	0	
22.	Feb. 6, 1921	Training station, Great Lakes, Ill.	1	0	0	0	

23.....	Mar. 5, 1921	Navy yard, Norfolk, Va.....	1	0	{Apr. 15, 1922 Apr. 28, 1922}	0	0
24.....	Feb. 9, 1921	Training station, Great Lakes, Ill.....	0	Oct. 30, 1920	0	0	0
25.....	Feb. 3, 1921	.....do.....	0	Dec. 11, 1920	0	Jan. 14, 1921	0
26.....	Apr. 4, 1921	.....do.....	0	0	0	Dec. 8, 1920	0
27.....	Apr. 18, 1921	U. S. S. Fishhawk.....	0	Apr. 11, 1921	0	0	0
28.....	Mar. 18, 1921	U. S. S. Monocacy.....	2	Aug. 21, 1919	0	0	0
29.....	Mar. 7, 1921	Marine detachment, American Legation, Peking, China.....	0	Feb. 2, 1919	0	0	0
30.....	Mar. 10, 1921	Training station, Great Lakes, Ill.....	0	Mar. 26, 1919	0	0	0
31.....	Feb. 6, 1921	Training station, San Francisco, Calif.....	0	Jan. 25, 1921	0	0	0
32.....	Feb. 8, 1921	Training station, Great Lakes, Ill.....	1	Dec. 21, 1920	0	0	0
33.....	Feb. 8, 1921	.....do.....	2	Oct. 31, 1920	0	0	0
34.....	Feb. 8, 1921	.....do.....	0	Oct. 26, 1920	0	0	0
35.....	May 24, 1921	U. S. S. Prometheus.....	1	Aug. 30, 1920	0	Aug. 26, 1920	0
36.....	Feb. 11, 1921	Training station, Hampton Roads, Va.....	0	July 30, 1920	0	Mar. 17, 1921	0
37.....	Feb. 19, 1921	Receiving ship, Puget Sound, Wash.....	0	0	Aug. 3, 1921	July 4, 1920	0
38.....	Dec. 29, 1921	Marine barracks, Norfolk, Va.....	0	0	0	July 23, 1920	0
39.....	Feb. 18, 1921	U. S. S. Mississippi.....	0	July 8, 1920	Feb. 17, 1921	June 19, 1920	0
40.....	Oct. 26, 1921	.....do.....	0	0	0	July 3, 1920	0
41.....	Mar. 13, 1921	Receiving ship Cavite, P. I.....	0	{Apr. 18, 1917 Apr. 1, 1918}	0	Jan. 19, 1920	0
42.....	Mar. 12, 1921	U. S. S. Aroostook.....	0	0	0	Jan. 31, 1920	0
43.....	Mar. 1, 1921	U. S. S. Mississippi.....	0	{May 28, 1919 Feb. 15, 1921}	0	Feb. 7, 1920	0
44.....	Feb. 15, 1921	.....do.....	1	0	0	Oct. 18, 1920	0
45.....	Feb. 15, 1921	.....do.....	1	0	May 4, 1921	Feb. 2, 1921	0
46.....	Feb. 11, 1921	.....do.....	0	0	0	Oct. 1, 1921	0
47.....	Jan. 7, 1921	First Provisional Brigade, Haiti.....	1	Jan. 7, 1919	Oct. 7, 1921	May 27, 1918	0
48.....	Feb. 17, 1921	U. S. S. Mississippi.....	1	Sept. 24, 1919	Sept. 11, 1919	June 5, 1918	0

¹ None given at time of enlistment.

Case.	Date of onset.	Where developed.	Number of scars prior to enlistment.	Number of positive takes.	Immunity reactions.	Negative.	Remarks.
49.	Feb. 15, 1921	U. S. S. Mississippi.	0	Sept. 24, 1919	0	Sept. 2, 1919	
50.	Feb. 18, 1921	do.	0	Sept. 11, 1919	0	Sept. 12, 1920	
51.	Feb. 19, 1921	do.	0	Aug. 8, 1919	0	0	
52.	Feb. 15, 1921	do.	0	0	0	Oct. 16, 1919	
53.	do.	do.	1	Sept. 24, 1918	0	Oct. 23, 1919	
54.	Feb. 18, 1921	do.	1	Apr. 27, 1918	0	Oct. 16, 1919	
55.	Feb. 15, 1921	do.	0	Feb. 16, 1921	0	Oct. 23, 1919	
56.	do.	do.	0	Oct. 22, 1919	0	Oct. 30, 1919	
57.	Mar. 1, 1921	do.	0	0	0	Feb. 20, 1919	
58.	Feb. 17, 1921	do.	0	June 30, 1919	0	Nov. 2, 1920	
59.	Mar. 17, 1921	do.	1	0	0	Nov. 9, 1920	
60.	Feb. 17, 1921	do.	0	May 12, 1919	0	Nov. 16, 1920	
61.	Feb. 16, 1921	do.	0	Oct. 2, 1919	0	Jan. 3, 1921	
62.	Feb. 17, 1921	do.	0	June 30, 1919	0	Feb. 16, 1921	
					0	Mar. 30, 1921	
					0	Sept. 2, 1919	
					0	Apr. 26, 1921	
					0	Nov. 16, 1920	
					0	Jan. 2, 1921	

HEALTH OF THE NAVY.

Health conditions as indicated by morbidity reports for July were satisfactory. The admission rate for all causes was 491.6 per 1,000 per annum as compared with 528.7 per 1,000, the corresponding five-year median rate for July. The admission rate for all diseases, exclusive of injuries and poisons, was 436.5, as compared with the median July rate for the preceding five years, 456.3 per 1,000 per annum.

The rate for accidental injuries was 55.15 per 1,000 per annum, a figure that is not remarkable.

Communicable diseases were not unduly prevalent during July. Mumps is more prevalent this summer than last year. The annual seasonal increase in the prevalence of malaria is beginning to be noticeable. There were 128 cases during the month of July. Eighty-seven cases of measles were reported during the month as compared with 93 in June. This incidence is about three and one-half times greater than is to be expected from the median rate for July. Influenza was less prevalent than usual at this time of year so soon after a pandemic period. One hundred and twenty-five cases were reported.

It is noteworthy that while the admission rate for measles was three and one-half times greater than our median experience for July, the admission rate for pneumonia, all forms, was considerably below the median July rate for these infections. These figures are in agreement with the conclusion that measles complications are relatively infrequent during the summer months.

The admission rate for communicable diseases, exclusive of tonsillitis and common colds was 56.2 per 1,000 per annum as compared with 67.7, the median July rate for recent years. The rate for tonsillitis and common infections of the respiratory tract was 59.9 per 1,000 per annum. The July median rate for these affections is 76.2.

Less than half of the measles cases occurred at naval training stations and only 20 per cent were reported from ships; the remaining cases were scattered among foreign stations and shore stations in the United States.

Of the 150 cases of mumps reported, 63 cases occurred in the United States fleet, most of them in battleships and destroyers on both coasts of the United States. Only 12 cases occurred at training stations.

The following table shows annual admission rates per 1,000 per annum for certain communicable diseases, entire Navy, for the

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month of July, 1923, in comparison with median rates for the same month, 1918 to 1922, inclusive:

	Median rate for July, 1918-1922, inclusive.	July, 1923.		Median rate for July, 1918-1922, inclusive.	July, 1923.
Cerebrospinal fever.....	0.40	0	Mumps.....	10.36	13.45
Diphtheria.....	1.72	0.27	Pneumonia.....	3.21	2.16
German measles.....	0.19	1.08	Scarlet fever.....	0.52	0.63
Influenza.....	14.97	11.21	Smallpox.....	0.07	0
Malaria.....	8.13	11.48	Tuberculosis.....	4.58	2.96
Measles.....	2.16	7.80	Typhoid fever.....	0.09	0.09

EPIDEMIC JAUNDICE IN NEW YORK STATE, 1921-22.

The following epidemiological study and analysis of 700 cases was made by Huntington Williams, M. D., Dr. P. H., sanitary supervisor, New York State Department of Health, and published in Health News, May, 1923, issued by the division of public health education, New York State Department of Health.

During the winter of 1921-22 New York State was visited over a very wide area by so-called infectious or epidemic jaundice. This disease was present at the same time in other parts of the country. Previous to the epidemic localized outbreaks had been studied by the New York State Department of Health in the village of Philadelphia, Jefferson County, in the winter of 1915-16; at Berkshire, Tioga County, in March, 1920; and in Chenango County during February, 1921. The disease as it appeared at Cooperstown, N. Y., during the recent state-wide epidemic has already been described.

It may be noted that during 1896 there occurred at Albany a well-marked outbreak of epidemic jaundice. At Hudson, N. Y., a similar epidemic occurred a few years previously. Reports from practitioners indicate that at certain localities in Delaware County, Allegany County, and especially in St. Lawrence County, repeated outbreaks of epidemic jaundice have occurred at varying intervals during the last 30 years. Up to 100 cases appear in some of these reports, and nowhere were uncomplicated cases recorded which terminated fatally. Multiple cases in households and in schools were frequently found in these earlier outbreaks. This history is interesting as having a possible relation to the outbreaks of influenza in the early nineties and again in 1918.

A detailed study of 700 cases of epidemic jaundice was made by the State sanitary supervisors in accordance with plans drawn by Dr. Edward C. Godfrey, jr., director of the division of communicable diseases of the State department of health. These cases represent approximately half the known cases that occurred during the epi-

demic in New York State (excluding New York City), and in addition there were many cases that were so mild that they were not seen by a physician or recorded in any way. The 700 cases here analyzed were reported from the 25 counties of Albany, Broome, Columbia, Delaware, Erie, Franklin, Genesee, Jefferson, Livingston, Madison, Monroe, Niagara, Ontario, Orange, Oswego, Otsego, St. Lawrence, Seneca, Steuben, Sullivan, Tioga, Ulster, Warren, Wayne, and Wyoming.

Symptomatology.—The disease appeared to be mild in character, although the gastrointestinal symptoms were often distressing. In typical cases there was a slight initial fever, with several days of anorexia, nausea, vomiting, abdominal pain, constipation, clay-colored stools, and bile-stained urine. After this period, which lasted usually from three days to a week, jaundice appeared and the abdominal symptoms decreased markedly in severity. The jaundice persisted for varying periods from several days to several weeks. It was sometimes observed only in the eyes, but in other cases it was widespread over the body and of a deep shade. Convalescence was almost invariably slow, and was marked by prostration very frequently of a severe type. In rare cases when seen in the prejaundice stage, there was noticed a faint rash on the arms and upper chest, together with a superficial tenderness and roughening of the skin in these parts. As a rule, however, no record was made of this symptom. The physician frequently considered the disease intestinal grippe, perhaps because the jaundice epidemic came fairly soon after the pandemic of influenza. In this connection it is of interest to note that there was a moderate leukocytosis present in half of the cases at Cooperstown, which were studied early in the disease, and in no case was there reported a leukopenia.

Five atypical cases.—Throughout the epidemic there occurred only five known fatal cases, in each of which there were complications. Two of these were in infants born to mothers ill with jaundice at the time of delivery. One infant was born jaundiced and lived only 36 hours. The other was born with clear skin but on the second day after birth developed a yellow tint over the body. On the third day the baby began to bleed profusely from the bowel. This condition continued at intervals until the death of the child on the fourth day. The third fatal case was that of a girl, aged 5 years, who had very marked jaundice for two weeks, with constipation and clay-colored stools. The child had an irregular temperature during this time, with marked prostration, similar to that of influenza. There were signs of encephalitis, and the chemical test for bile was positive in the spinal fluid. The fluid was of clear color, and gave a low cell count. Another fatal case was that of a girl, aged 6 years, whose jaundice was complicated by existing renal disease due to

scarlet fever contracted a year previously. In this case the attending physician attributed death to acute nephritis. The remaining fatal case was that of a boy, aged 14 years. He developed jaundice, which cleared up after a week's duration. Two weeks after this the jaundice returned and became very marked. There developed typical symptoms of meningitis at this time, and the child died four days after the second appearance of the jaundice.

Epidemiology.—It is of interest to note that (1) of the 700 cases studied the sex distribution is almost exactly equal (50.4 per cent males); (2) a little more than half (51.7 per cent) of the cases were in the school-age group, from 5 to 14 years, and outbreaks often centered in a school; (3) in more than half the cases the dates of onset were during the months of November and December, 1921, and (4) multiple cases in a household or a school were very common.

Dates of onset.—Of the 700 cases, the dates of onset in 672 cases were between September 1, 1921, and March 2, 1922, and are recorded in Table 4. In addition, the onset in 17 cases occurred between March 1 and August 31, 1921, and in 11 cases there was no recorded date of onset.

Multiple cases in household or school.—Of the cases, 421, or 60 per cent, were multiple—that is, more than one case occurred in a household. The maximum number in a home was eight. In 83 instances, there were 2 cases in a household; in 33, 3; in 20, 4; in 7, 5; in 3, 6; in 1 instance, 7; and in 2 instances, 8.

In one instance (at Cooperstown, N. Y.), 14 children in a one-room school of 36 pupils developed the disease, over a period of two and one-half months. In another school, all the pupils but two developed the disease. In a third school, the teacher and also the physician gave the information that nearly every child in the room had had an attack of jaundice, and in a fourth school district, in St. Lawrence County, every child but one had jaundice, and in connection with the school outbreak other children in the homes had secondary cases of the same disease. This apparent susceptibility to infectious jaundice among school children was also noted in an outbreak in St. Lawrence County which occurred about 25 years ago. In this connection attention is again called to the age distribution of the 700 cases here reported.

Laboratory investigations.—Special investigations were made by the division of laboratories and research of the State department of health with the hope of discovering the specific etiologic agent in this disease. Blood, urine, feces, and throat cultures from patients with the epidemic disease were examined, and in no case were positive results obtained in isolating *Leptospira icterohaemorrhagiae* or any other organism of significance.

Comment.—The causative factor of the epidemic here described has not been determined. There is no evidence that rat-borne or other contamination of human food supplies was of etiologic importance. The relationship is uncertain between this State-wide outbreak and instances of infectious spirochetal jaundice that have been reported in Japan and in Europe. The identity of the American type and the foreign type of infectious jaundice has never been established. On epidemiologic grounds there is a marked difference, in that the American type seems to be readily communicable by direct contact, and it occurs in quite well-defined outbreaks, especially among school children. These features are not characteristic of spirochetosis. It is not certain whether epidemic jaundice, which was known to Hippocrates and his disciples, and which is often spoken of as Weil's disease, is a single disease entity, or whether it may result from a number of different etiologic factors. Jaundice was prevalent among the Federal troops during the Civil War, and has often been associated with troops in other wars.

Of 700 cases here analyzed, more than half were in children of the school age (from 5 to 14 years). Multiple cases in a household or a school were extremely common. The peak of the epidemic was in November and December, 1921. Marked prostration and slow recovery were characteristics of many cases of the disease. For these reasons, and because of personal observation of the Cooperstown outbreak, I am of the opinion that the epidemic jaundice that occurred throughout New York State during the winter of 1921-22 was spread by droplet or contact infection from person to person, and that the etiologic agent of this epidemic may have been some unrecognized organism or virus that is carried in the nasopharyngeal secretions of persons ill of the disease.

THE PUBLIC HEALTH AND THE DISPOSAL OF GARBAGE.

Garbage and refuse were regarded as important factors in the spread of disease long before the era of real sanitary science. Organized health departments from their earliest days have stressed the importance of proper disposal as a public health measure. Now, public health officials are often vexed by questions that arise not only with regard to the great expense involved in handling a public utility of considerable magnitude but also by the question, "How important, after all, is the subject from a practical public health standpoint?" Under certain conditions, of course, there may exist a definite and important relationship between improper disposal and the spread of disease. On the other hand, health departments are

often handicapped financially when the health officer is responsible for this work, which properly belongs to a city service department, under such sanitary supervision as may be required. Where the work must be carried on by the health department, the effect of the large annual appropriations necessary for this activity is to add to the difficulty of securing adequate appropriations for real public health measures.

Even in the Navy, where the actual work of disposal is not among the responsibilities of the medical department, questions not infrequently arise to vex the medical officer. It is of interest, therefore, to note the viewpoint of the health department of Detroit. This old problem is discussed logically in the Weekly Health Review published by the department of health, city of Detroit, for the week ending July 14, 1923, under the title "Public health or æsthetic problems," as follows:

"Up to 10 years ago it was not at all uncommon to find garbage and refuse disposal a function of the local health department. Although to-day this is usually a responsibility of some other department, health departments are still often concerned with the investigation of complaints regarding uncovered or inadequate garbage receptacles and insanitary conditions of alleys and yards. Undoubtedly, such conditions are nuisances which ought to be attended to. There is, however, an unanswered question as to where the public health problem ends and the purely æsthetic problem begins. Uncovered garbage cans are unquestionably unsightly, disgusting, and odorous and as such are a nuisance which should be abated. In providing a food supply for rats they produce an additional nuisance which in seaport cities forms a distinct public health menace. In breeding flies the nuisance is still further increased, and a potential carrier of disease is produced. The fly undoubtedly plays a more important part in the transmission of disease in rural communities, where large numbers of open privies are to be found, than it does in cities where methods of sewage disposal are more sanitary. Accumulations of refuse, except as a possible home for rats, unless they contain organic material, are chiefly nuisances against our æsthetic senses and do not form an important public health problem.

"Whether or not improper care of garbage constitutes a real public health problem is chiefly a question as to how great a menace the rat is, how many flies breed in garbage, and what part the fly plays in the spread of disease. The rat anywhere is a potential source of danger, but in inland cities, where plague is not endemic, it seems unlikely that he plays any very important part in the transmission of disease. The rat problem in such communities is chiefly an economic one, the annual losses caused by rats being enormous.

Should the Great Lakes cities become ports for trans-Atlantic shipping, Detroit's rat problem might well become one of public health.

"We are accustomed to think of garbage as a breeding place of flies, but, as a matter of fact, how many of them actually do breed there? Manure is, of course, a much more favorable breeding place than garbage, and in cities where garbage is collected once a week or oftener there should be no fly breeding, provided the collector entirely empties each receptacle. Where collections are regular any flies which hatch out must have been bred either in the small residue left in the receptacle after collection has been made or in spilled garbage. The passing of the horse and the substitution of the automobile has very greatly reduced the fly problem, especially in the cities. If there were a better observance of the law requiring householders to clean garbage receptacles and more attention given to the disposal of spilled garbage, the number of flies would be decreased still further.

"Do flies present an important public health problem in the modern city? Frankly, we have not the knowledge to definitely answer the question, but it seems probable that with the decrease in the number of flies and with the great majority of homes properly sewered there is comparatively little opportunity for the fly to spread communicable disease. Food for babies and very small children should be effectively protected from the fly, for he may well play an important rôle in the spread of diarrheal diseases. Is not the question worthy of careful study? If it could be definitely established that flies in the modern city did not constitute a public health problem, and we are inclined to think that they do not, it would mean not that the fly abatement question could be dropped, but that it could be eliminated from a purely public health program.

"There is not the slightest doubt but that money is well spent on garbage and refuse disposal and their attendant nuisances, but there is a question as to whether or not money should be spent from public health appropriations for these purposes unless they present important public health problems. If, for example, a city makes an appropriation of \$2 per capita for public health, and 70 cents of that \$2 is spent on garbage, rat, and refuse complaints, is that city really spending \$2 per capita on public health? We are inclined to say that it is not."

NOTES FROM THE SUBMARINE BASE AND NAVAL AIR STATION, COCO SOLO, CANAL ZONE.

Prevalence of malaria.—General sanitation of the submarine base and the naval air station is good. The mosquitoes have greatly increased in number. Steps are being taken to drain the area reported

previously and, in the meantime, this area is being heavily oiled and water holes filled, which has checked the number of mosquitoes caught very materially.

During the month 13,246 mosquitoes were caught, as compared to 4,656 caught the month previously, showing an enormous increase in the malarial (anopheles) mosquitoes.

	Submarine base.	Air station.	Total.
Culex.....	4,259	1,264	5,523
Anopheles.....	6,304	1,419	7,723
Total.....			13,246

Thirty-two original admissions for malaria and three readmissions during the month show the expected increase in cases at this time of the year.

NOTES FROM NAVAL TRAINING STATIONS.

NEWPORT, R. I.

The sanitary conditions of this station have been excellent during June, 1923. The incidence of illness has been greatly reduced and contagious diseases have been noticeably absent. The complement has increased somewhat and has averaged about 1,300 men under training. Climatic conditions are at their best for this latitude and the greater part of the training course is given in the open air. The dietary of the various messes is much improved by the addition of seasonable vegetables and supervision over their preparation. The sterilization of mess gear has been perfected in process, particularly in barracks "A," and is being satisfactorily performed. In general, the recruits gain in weight while under training and the few cases showing loss of weight are usually found to be due to physiological causes. Athletic exercises are now part of the training course and definite hours are designated for their performance.

Diphtheria.—Two cases of diphtheria developed in recruits that were transferred to the naval hospital at Newport, R. I. These cases did not present evidences of diphtheria upon examination at the training station and were diagnosed by routine culture methods. There were no carriers of the diphtheria bacillus detected during the month. From the above and preceding reports it may be noticed that a few cases of diphtheria occur each month. Preventive measures adopted against the occurrence of epidemics of this disease include effective sterilization of mess gear and early transfer to hospital of

all throat cases. In this connection the training station medical department appreciates the spirit of cooperation demonstrated by the naval hospital at Newport in making routine early cultures from all throat cases received at the hospital from this station.

HAMPTON ROADS, VA.

Although the average complement of the station for the month of June has been about 400 less than for the month of May, the sick reports show practically the same number of admissions and transfers to the hospital, as will be noted by figures given below. An explanation for these facts is difficult to make, although there have been numerous cases sent to the hospital, with the expectation that they would be discharged by medical survey, who have been returned, unfit for duty, and have again been placed on the sick list. Cases of this type are increasing in numbers, and we have had several men who have been to the hospital as many as four times, returned each time with their health records marked "fit for duty." Of course, these cases increased the admissions to the sick list and also the total number of sick days.

Measles still continues to crop up sporadically, but is confined to units "X" and "D." Venereal diseases are slightly less prevalent than during the month of May. Sanitary conditions of the station are satisfactory. The swimming pools have caused considerable anxiety because of the large bacterial count shown in the water examinations made three times each week. Chlorination of the water in one pool has been practiced during the month, with very good results in keeping down the bacterial count. Certain experiments have been made in connection with the ability of violet rays to properly disinfect the water in the pools. A full report of these experiments will be made when all data are obtained and tabulated, but it may be said at this time that violet rays are not nearly as efficacious as is claimed by the manufacturer. We know that chlorine, properly applied, is efficacious, and we have proved that during the month. Furthermore, no complaint has reached the medical officer regarding any discomfort from the introduction of a chlorine solution into the water. The water, as it is received from the city supply into the reservoir, for drinking purposes and general use is most excellent in quality.

Antimosquito work was carried out on the base during the month of June by continued use of crude oil. The results appear to be satisfactory, as no great numbers of mosquitoes have been noticed, and it is believed that the source of what few found can be traced to the Virginia Railway property outside of the base. Inspections have been made of the territory in question and mosquitoes were

found to be breeding, but since these breeding places do not come under the jurisdiction of the Medical Department, no treatment was applied.

The sanitary condition of the base, taken as a whole, is considered to be satisfactory at this time. A careful survey of the entire base is made once each week for possible breeding places for flies, and larvicide has been applied to all places of a suspicious nature.

Two hundred and eighty-five rodents were trapped during the month of June, an average of 11 each day for 25 working-days. This number is two more than last month's work, but since one man has been devoting his entire time to extermination of these pests it is evident that they are becoming reduced.

VITAL STATISTICS.

The Monthly Health Index, which is published on the 15th of each month, contains the statistical data for individual ships and shore stations. The statistics appearing in this bulletin are summaries compiled from those published in the Monthly Health Index.

Annual rates, shown in the succeeding statistical table, are obtained as follows:

The total number of admissions to the sick list or the number of deaths reported during the period indicated is multiplied by $\frac{365}{x}$ or $\frac{365}{y}$ or 12, depending upon whether the period includes four or five weeks or a calendar month. The product is then multiplied by 1,000 and divided by the average complement.

TABLE NO. 1.—*Monthly report of morbidity in the United States Navy and Marine Corps for the month of July, 1923.*

	Forces afloat.	Forces ashore.	Entire Navy.	Marine Corps.
Average strength.....	75,014	38,785	113,799	19,918
All causes:				
Number of admissions.....	2,995	2,487	5,482	1,048
Annual rate per 1,000.....	479.11	769.45	491.62	547.20
Disease only:				
Number of admissions.....	2,690	2,177	4,867	912
Annual rate per 1,000.....	430.32	673.54	436.47	476.19
Communicable diseases, exclusive of venereal disease:				
Number of admissions.....	345	281	626	121
Annual rate per 1,000.....	55.19	86.95	56.15	63.18
Venereal disease:				
Number of admissions.....	1,083	389	1,472	252
Annual rate per 1,000.....	173.15	120.35	132.01	131.58
Injuries and poisons:				
Number of admissions.....	305	310	615	126
Annual rate per 1,000.....	48.79	95.91	55.15	71.01

TABLE No. 2.—Number of admissions reported by Form F cards for certain diseases for the month of July, 1923.

	Forces afloat, Navy and Marine Corps (strength, 75,014).		Forces ashore, Navy and Marine Corps (strength, 38,785).		Total (strength, 113,799).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases.....	2,690	430.32	2,177	673.54	4,867	436.47
Injuries and poisons.....	305	48.79	310	95.91	615	55.15
Total admissions.....	2,995	479.11	2,487	769.45	5,482	491.62
Class III:						
Appendicitis, acute.....	35	5.60	50	15.47	85	7.62
Autointoxication, intestinal.....	5	.80	10	3.09	15	1.35
Cholangitis, acute.....	19	3.04	9	2.78	28	2.51
Cholecystitis, acute.....	1	.16	2	.62	3	.27
Cholelithiasis.....	1	.16	1	.31	2	.18
Colitis, acute.....	2	.32	0	0	2	.18
Constipation.....	15	2.40	35	10.83	50	4.48
Enteritis, acute.....	24	3.84	26	8.04	50	4.48
Gastritis, acute catarrhal.....	9	1.44	7	2.17	16	1.43
Gastroenteritis.....	32	5.12	36	11.14	68	6.10
Hemorrhoids.....	12	1.92	25	7.73	37	3.32
Pharyngitis, acute.....	11	1.76	18	5.57	29	2.60
Ulcer of duodenum.....	1	.16	4	1.24	5	.45
Ulcer of stomach.....	0	0	2	.62	2	.18
Total.....	167	26.71	225	69.61	392	35.15
Class VII:						
Varicocele.....	3	.48	10	3.09	13	1.17
Class VIII:						
Chickenpox.....	5	.80	3	.93	8	.72
Diphtheria.....	1	.16	2	.62	3	.27
German measles.....	8	1.28	4	1.24	12	1.08
Influenza.....	94	15.04	31	9.59	125	11.21
Measles.....	36	5.76	51	15.78	87	7.80
Mumps.....	122	19.52	28	8.66	150	13.45
Pneumonia, broncho.....	4	.64	8	2.48	12	1.08
Pneumonia, lobar.....	3	.48	9	2.78	12	1.08
Scarlet fever.....	6	.96	1	.31	7	.63
Total.....	279	44.63	137	42.39	416	37.31
Class IX:						
Dysentery, bacillary.....	0	0	4	1.24	4	.36
Dysentery, entamebic.....	1	.16	2	.62	3	.27
Typhoid fever.....	0	0	1	.31	1	.09
Total.....	1	.16	7	2.17	8	.72
Class X:						
Dengue.....	10	1.60	31	9.59	41	3.68
Malaria.....	40	6.40	88	27.23	128	11.48
Total.....	50	8.00	119	36.82	169	15.16
Class XI:						
Tuberculosis (all forms).....	15	2.40	18	5.57	33	2.96
Class XII:						
Chancroid.....	261	41.75	70	21.66	331	29.68
Gonococcus infection.....	757	121.10	256	79.20	1,013	90.85
Syphilis.....	65	10.40	63	19.49	128	11.48
Total.....	1,083	173.25	389	120.35	1,472	132.01
Class XVIII:						
Bronchitis, acute.....	143	22.88	154	47.65	297	26.63
Laryngitis, acute.....	3	.48	5	1.55	8	.72
Pleurisy, acute fibrinous.....	8	1.28	2	.62	10	.90
Rhinitis, acute.....	14	2.24	9	2.78	23	2.06
Tonsillitis, acute follicular.....	221	35.35	109	33.72	330	29.59
Total.....	389	62.23	279	86.32	668	59.91
Class XX:						
Hernia.....	18	2.88	26	8.04	44	3.95

TABLE No. 3.—Summary of annual admission rates for venereal disease reported from ships for June and from various shore stations for the five-week period July 1 to August 4, 1923.

	Annual rate per 1,000, June.			Average rate since Jan. 1, 1923.		
	Mini-mum rate.	Mean rate.	Maxi-mum rate.	Mini-mum rate.	Mean rate.	Maxi-mum rate.
All ships.....	0	148.01	1,609.76	0	147.85	1,661.87
Battleship divisions—						
Battle Fleet.....	65.98	114.58	174.76	62.91	90.59	116.98
Scouting Fleet.....	46.73	102.88	141.77	87.35	139.75	139.17
Asiatic Fleet.....	0	427.72	950.49	166.67	602.69	1,371.43
Destroyer squadrons—						
Battle Fleet.....	0	84.93	943.82	19.48	90.61	206.90
Scouting Fleet.....	0	144.58	840.00	18.21	204.82	314.24
Asiatic Fleet.....	121.21	287.86	367.35	124.35	463.80	1,226.67
Miscellaneous—						
Battle Fleet.....	0	100.33	421.05	0	144.34	264.70
Scouting Fleet.....	0	173.04	690.65	79.61	173.97	400.49
Asiatic Fleet.....	220.18	1,033.39	1,609.75	108.11	580.14	1,661.87
Naval forces, Europe.....	0	207.00	612.24	55.73	207.00	885.91
Special service squadron, based on Panama.....	145.45	247.12	352.94	190.02	247.12	378.10
Naval transport service.....	0	170.90	631.58	70.59	170.90	295.77

	Annual rate per 1,000, July 1 to Aug. 5, 1923.			Average rate since Jan. 1, 1923.		
	Mini-mum rate.	Mean rate.	Maxi-mum rate.	Mini-mum rate.	Mean rate.	Maxi-mum rate.
All naval districts in the United States.....	0	78.86	376.81	0	70.92	195.42
First naval district.....	31.26	68.50	156.22	42.15	56.94	93.62
Third naval district.....	20.12	41.14	57.79	10.37	53.47	100.81
Fourth naval district.....	0	123.03	272.25	72.07	135.74	195.42
Fifth naval district.....	31.10	81.41	130.61	56.91	76.61	84.03
Sixth naval district.....	72.44	91.99	376.81	47.59	49.19	169.35
Seventh naval district.....	0	0	0	0	11.33	11.33
Eighth naval district.....	0	39.47	48.15	49.02	66.32	70.06
Ninth naval district.....	210.26	210.26	210.26	90.27	90.27	90.27
Eleventh naval district.....	72.62	70.20	76.17	29.02	69.37	131.71
Twelfth naval district.....	25.59	51.24	85.54	46.46	74.09	92.99
Thirteenth naval district.....	40.94	53.66	78.20	35.73	70.45	120.19

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE.

	Per cent, June.		Per cent since Jan. 1, 1923.	
	Gono-coccus.	Syphilis.	Gono-coccus.	Syphilis.
All ships.....	72.19	4.58	66.57	8.04
Battleship divisions—				
Battle Fleet.....	88.68	5.03	74.11	10.76
Scouting Fleet.....	73.77	3.28	69.11	9.08
Asiatic Fleet.....	44.44	0	48.21	7.14
Destroyer squadrons—				
Battle Fleet.....	86.84	0	76.13	4.05
Scouting Fleet.....	70.83	12.50	63.41	8.71
Asiatic Fleet.....	87.50	6.25	63.29	5.48
Miscellaneous—				
Battle Fleet.....	88.57	5.71	65.19	8.57
Scouting Fleet.....	58.97	6.41	61.81	6.48
Asiatic Fleet.....	55.10	2.04	53.80	7.06
Naval forces, Europe.....	50.00	2.94	50.00	2.94
Special service squadron, based on Panama.....	70.59	2.94	70.59	2.94
Naval transport service.....	52.94	3.92	52.94	3.92

TABLE No. 3.—Summary of annual admission rates for venereal disease reported from ships for June, etc.—Continued.

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE—Continued.

	Per cent, July 1 to Aug. 4, 1923.		Per cent since Jan. 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All naval districts in the United States.....	80.61	6.63	75.48	11.83
First naval district.....	77.78	14.81	78.91	8.59
Third naval district.....	77.78	11.11	75.34	13.70
Fourth naval district.....	86.67	6.67	74.31	7.34
Fifth naval district.....	79.22	7.79	71.05	14.25
Sixth naval district.....	68.42	0	64.71	10.29
Seventh naval district.....	0	0	100.00	0
Eighth naval district.....	50.00	0	78.95	7.90
Ninth naval district.....	88.46	3.85	88.64	6.82
Eleventh naval district.....	100.00	0	86.05	13.51
Twelfth naval district.....	90.00	0	81.99	11.80
Thirteenth naval district.....	100.00	0	85.00	12.50

TABLE No. 4.—Number of admissions reported by Form F cards and annual rates per 1,000, entire Navy, for the five-week period July 1 to Aug. 4, 1923, inclusive.

	Navy (strength, 93,881).		Marine Corps (strength, 19,918).		Total (strength, 113,799).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases of blood.....	2	0.22	1	0.52	3	0.27
Diseases of circulatory system.....	31	3.43	8	4.18	39	3.56
Diseases of digestive system.....	490	54.28	147	76.75	637	58.21
Diseases of ductless glands and spleen.....	4	.44	2	1.04	6	.55
Diseases of ear.....	95	10.52	16	8.35	111	10.14
Diseases of eye and adnexa.....	61	6.76	13	6.79	74	6.76
Diseases of genito-urinary system (nonvenereal).....	150	16.62	26	13.58	176	16.08
Communicable diseases transmissible by oral and nasal discharges.....	410	45.42	41	21.41	451	41.22
Communicable diseases transmissible by intestinal discharges.....	3	.33	5	2.61	8	.73
Communicable diseases transmissible by insects and other arthropods.....	111	12.30	71	37.07	182	16.63
Tuberculosis (all forms).....	33	3.66	4	2.09	37	3.38
Venereal diseases.....	1,306	144.67	252	131.58	1,558	142.38
Other diseases of infective type.....	265	29.35	70	36.55	335	30.62
Diseases of lymphatic system.....	60	6.65	23	12.01	83	7.58
Diseases of mind.....	34	3.77	13	6.79	47	4.29
Diseases of motor system.....	75	8.31	14	7.31	89	8.13
Diseases of nervous system.....	67	7.42	10	5.22	77	7.04
Diseases of respiratory system.....	829	91.83	120	62.66	949	86.72
Diseases of skin, hair, and nails.....	83	9.19	31	16.19	114	10.42
Hernia.....	42	4.65	8	4.18	50	4.57
Miscellaneous diseases and conditions.....	186	20.60	19	9.92	205	18.73
Parasites (fungi and certain animal parasites).....	68	7.53	11	5.74	79	7.22
Tumors.....	9	1.00	7	3.65	16	1.46
Diseases of women.....	1	.11	0	0	1	.09
Injuries.....	492	54.50	120	62.66	612	55.92
Poisons.....	30	3.32	16	8.35	46	4.20
Total.....	4,937	546.87	1,048	547.20	5,985	546.91

TABLE No. 5.—Deaths reported, entire Navy, for the five-week period July 3 to August 4, 1923, inclusive.

Cause.	Navy (strength, 93,881).	Marine Corps (strength, 19,918).	Total (strength, 113,799).
Meningitis, cerebrospinal.....	1	0	1
Pneumonia, lobar.....	1	0	1
Measles.....	1	0	1
Other diseases.....	10	2	12
Drowning.....	5	2	7
Other injuries.....	14	1	15
Poisons.....	1	0	1
Total.....	33	5	38
Annual rates per 1,000, all causes.....	3.66	2.61	3.47
Annual rates per 1,000, disease only.....	1.44	1.04	1.37

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VOL. XIX

NO. 4

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PLANNING AND PUBLICATIONS
CAPTAIN D. N. CARPENTER, MEDICAL CORPS, U. S. NAVY
IN CHARGE

EDITED BY
LIEUTENANT COMMANDER W. M. KERR, MEDICAL CORPS, U. S. NAVY

OCTOBER, 1923
(MONTHLY)



Compiled and published under authority of Naval Appropriation Act for 1924
approved January 22, 1923

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

Owing to the exhaustion of certain numbers of the BULLETIN and the frequent demands from libraries, etc., for copies to complete their files, the return of any of the following issues will be greatly appreciated:

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Volume VIII, No. 1, January, 1914.
Volume VIII, N. 3, July, 1914
Volume VIII, No. 4, October, 1914.
Volume X, No. 1, January, 1916.
Volume XI, No. 1, January, 1917.
Volume XI, No. 3, July, 1917.
Volume XI, No. 4, October, 1917.
Volume XII, No. 1, January, 1918.
Volume XII, No. 2, April, 1918.
Volume XII, No. 3, July, 1918.

SUBSCRIPTION PRICE OF THE BULLETIN.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Yearly subscription, beginning January 1, \$1.50; for foreign subscription add \$1.00 for postage.

Single numbers, domestic, 15 cents; foreign, 21 cents, which includes foreign postage.

Exchange of publications will be extended to medical and scientific organizations, societies, laboratories, and journals. Communications on this subject should be addressed to the Surgeon General, United States Navy, Washington, D. C.

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PREFACE.

THE UNITED STATES NAVAL MEDICAL BULLETIN was first issued in April, 1907, as a means of supplying medical officers of the United States Navy with information regarding the advances which are continually being made in the medical sciences, and as a medium for the publication of accounts of special researches, observations, or experiences of individual medical officers.

It is the aim of the Bureau of Medicine and Surgery to furnish in each issue special articles relating to naval medicine, descriptions of suggested devices, clinical notes on interesting cases, editorial comment on current medical literature of special professional interest to the naval medical officer, reports from various sources, historical essays, notes and comments on topics of medical interest, and reviews or notices of the latest published medical books.

The bureau extends an invitation to all medical officers to prepare and forward, with a view to publication, contributions on subjects of interest to naval medical officers.

In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will send a letter of commendation to authors of papers of outstanding merit and will recommend that copies of such letters be made a part of the official records of the officers concerned.

The bureau does not necessarily undertake to indorse all views or opinions which may be expressed in the pages of this publication.

E. R. STITT,

Surgeon General United States Navy.

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U. S. NAVAL MEDICAL BULLETIN

VOL. XIX.

OCTOBER, 1923.

No. 4.

SPECIAL ARTICLES.

THE ROENTGENOLOGICAL STUDY OF INFECTIOUS ARTHRITIS.

By F. W. MULLER, Lieutenant, Medical Corps, United States Navy.

By adopting a constant technic in roentgenographic work many errors that occur in the interpretation of roentgenograms might be overcome. The use of a roentgenogram of the normal part for comparison is very desirable, and should always be made when children are radiographed. The use of the accepted position as the constant is often prevented because of variations in anatomical relations of the part to be studied. In these instances, for the purpose of comparison, the normal part should be placed in a similar position when the roentgenogram is made. Whenever it is feasible, the stereoscopic method should be adopted in studies of the shoulder, anklejoint, hip, lower spine, sacrum, and especially of the sacro-lumbar and sacro-iliac joint.

When making a roentgenogram of the hip in thin individuals, a sufficiently large plate may be used to include the entire pelvis. The feet should be placed with the toes pointing upward. When the knee joint is studied, under ordinary conditions an antero-posterior, with the plate posterior to the horizontal joint, and a lateral roentgenogram will suffice. Sometimes a postero-anterior view, with the patella upon the plate, is also desirable. An adequate study of the ankle joint requires one stereoscopic pair laterally and one single plate placed posteriorly. The usual method for the study of the elbow is in two directions. In addition to the lateral view, one plate should be made with the olecranon process resting upon it with the arm extended and the palmar surface of the hand facing upward. Studies of the wrist are usually carried out by roentgenograms made in two directions, a lateral view and one with the palmar surface of the hand resting upon the plate. In addition to these, a third should be made with the dorsum of the hand resting upon the plate.

The normal joint.—A normal joint consists of four structures, the articulating surfaces composed of cartilage, the synovial membrane, the ligaments, and the synovial fluid. The synovial membrane is a fibrous tissue sheath which forms a capsular covering inclosing the joint. Synovial membrane, unlike periosteum, is incapable of producing bone. There is neither periosteum nor free bone in a joint, and the elements of a normal joint can not be seen in a roentgenogram. X-ray evidence depends upon variations from normal in density of the soft parts, thickness of articular cartilage, and character of outline of subarticular bone.

Acute infectious arthritis.—The X-ray appearance of an infected joint depends largely upon the severity and upon the stage of the disease obtaining when the examination is made, namely, the onset, stage of maximum intensity, or stage of repair. In an acute infectious arthritis, no evidence, beyond perhaps a swelling of the soft tissues of the part, is produced on the roentgenogram. It is only when the condition becomes chronic that changes are produced which are roentgenographically regarded as indirect or direct evidence of joint destruction. With the inflammatory changes in the synovial membrane, indicated by an enlargement of the flesh and skin outline and the position of the part, there will be an increase in the synovial fluid. If the infection is severe, the cartilage will be next involved. As there are no blood vessels within the cartilage to carry infection, it can only be involved by direct contact. An erosion of the joint cartilage is determined by indirect X-ray evidence; that is, a diminished width of the joint space. If the cartilage is uniformly eroded, the muscular pull will bring the ends of the bones closer together, causing a narrowing of the joint space. Cartilage reproduces itself only to a limited degree and is replaced either by fibrous tissue or bone. Return to a normal condition depends largely upon the degree of destruction of the cartilage. Direct evidence of destruction of the bone beneath the cartilage is demonstrated upon an X-ray plate. Atrophy of bone and muscle occurs, depending upon the length of time of disuse. Rarefaction of bone is shown roentgenologically as a decrease in density and is caused by a diminution in calcium salts.

Classification of chronic arthritis.—The classification of the various forms of chronic arthritis is extremely difficult. No satisfactory classification has been made because of lack of accurate pathological knowledge, and atypical joints may be classified under more than one heading. The classification by Barker is as follows:

1. The true gouty arthropathies. (A. chronica urica.)
2. The arthropathies of severe nervous disease. (A. tabidorum; A. syringomyelica.)

3. The (primary) hypertrophic osteoarthropathies (osteoarthritis hypertrophicans or osteoarthritis deformans), a relatively benign affection.

4. The secondary chronic arthropathies, following various infections. (*A. luetica*, *A. tuberculosa*, *A. chronica gonorrhoeica*, *A. chronica rheumatica*, if it exists, etc.) and those following small foci of infection (microorganisms often unknown) in various parts of the body.

5. The so-called (primary) chronic progressive polyarthritides—of all arthropathies the most malign.

Barker states as follows: "Aside from gout, the neurogenic arthropathies, and possibly tuberculous and luetic arthritis, in which the X-ray plates are sometimes characteristic, the radiologist can rarely from the X ray alone speak with any certainty as regards etiology." He says further: "Finding how frequently disappearance of the joint slits, atrophy of cartilages, softening and distortion of bones with telescoping appear in the plates which," he is told, "have come from patients suffering from 'infectious arthritis,' an actinographer's tendency may be to group all cases exhibiting these changes under the heading 'infectious arthritis.' This inference may turn out to be justifiable, though it is, as yet, hypothetical." Nathan states: "All forms of arthritis are due to inflammations of infectious origin." Case studied roentgenographically the joint changes occurring in rabbits into whose ear veins there was introduced a culture of streptococcus from the tonsils of a patient suffering from rheumatoid arthritis. A final picture of rheumatoid arthritis in the human being was duplicated in the animal.

Pyogenic arthritis.—Infectious arthritis of the type caused by the staphylococcus, streptococcus, or pneumococcus, in the acute forms, attacks one or many joints, and is characterized by soft tissue swelling and effusion in the synovial cavity. If this process continues for several weeks, changes take place in the joint and bone. At an early stage rarefaction may occur as a result of fixation or neighborhood inflammation. The swelling and fluid are still present and the joint space is narrowed depending upon the degree of destruction of the cartilage. The bone beneath the cartilage may be involved, showing localized areas of destruction. (See fig. 1.) As the infection subsides, the swelling and fluid disappear and rarefaction is present until the joint begins to functionate. Where the cartilage is completely destroyed, it is replaced by fibrous tissue or the exposed bone proliferates forming an exostosis. The two opposing articulating surfaces may become ankylosed if denuded of cartilage. Recovery is signified by absence of swelling and fluid, disappearance of bone atrophy, and formation of exostoses or perhaps ankylosis, depending

upon the severity of the destructive process. This disease occurs at any age.

Gonorrheal arthritis.—Gonorrheal arthritis is usually monarticular and often does not present any X-ray appearance distinct from other pyogenic infections. In typical cases, there appears first an effusion in the capsule of the joint. As the disease progresses, localized erosion of the cartilage occurs giving the appearance shown in Figure 2. The final picture is one of narrowed joint slits and, in severe cases, bony ankylosis.

In the knee joint, which is frequently involved, there are two characteristic findings of Neisserian infection. First, thinning of the cartilage between the patella and femoral condyles resulting in a displacement of the patella backward into the intercondylar space. Lateral views are necessary for demonstration of this condition. Second, small localized areas of rarefaction may be present due to necrosis of the subcartilaginous bone at the lateral margins of joint surfaces on the femur and tibia. This condition is best shown in antero-posterior views.

The majority of the small calcareous deposits in tendinous insertions, particularly those upon the patella, os calcis, and olecranon, are of gonorrheal origin. In the acute stage there is no X-ray evidence of this condition and it is only after lime salts are deposited in the diseased tissues that this becomes visible. Therefore, the presence of these deposits signifies an old process.

Holmes and Ruggles state: "The second is the occurrence of small localized areas of rarefaction in the bone at the junction of articular surfaces and cortex. Another result of this infection is the development of new bone deposits along tendinous attachments. These spurs may be the result of the activity of other cocci, but the great majority are gonorrheal."

Blythe says that gonorrheal arthritis is seen especially in the knee and may be simple arthritis or may show effusion, destruction of the cartilage beneath the patella, and ankylosis.

Tuberculous arthritis.—Tuberculosis of a joint is characterized by soft tissue swelling, effusion in the capsule, and general blurring of the joint outlines, which have a hazy appearance suggesting a picture of poor quality. (See fig. 3.) However, the bones beyond the affected joint show normal detail and density. In patients whose epiphyses are still ununited, which includes the great majority of these cases, enlargement and squaring of the epiphysis occurs as a result of synovial irritation. In the more severe cases, more or less destruction of the epiphysis ultimately supervenes. With rare exceptions, new bone formation does not occur until secondary pyo-



Fig. 1.—Chronic Infectious Arthritis, Pyogenic.

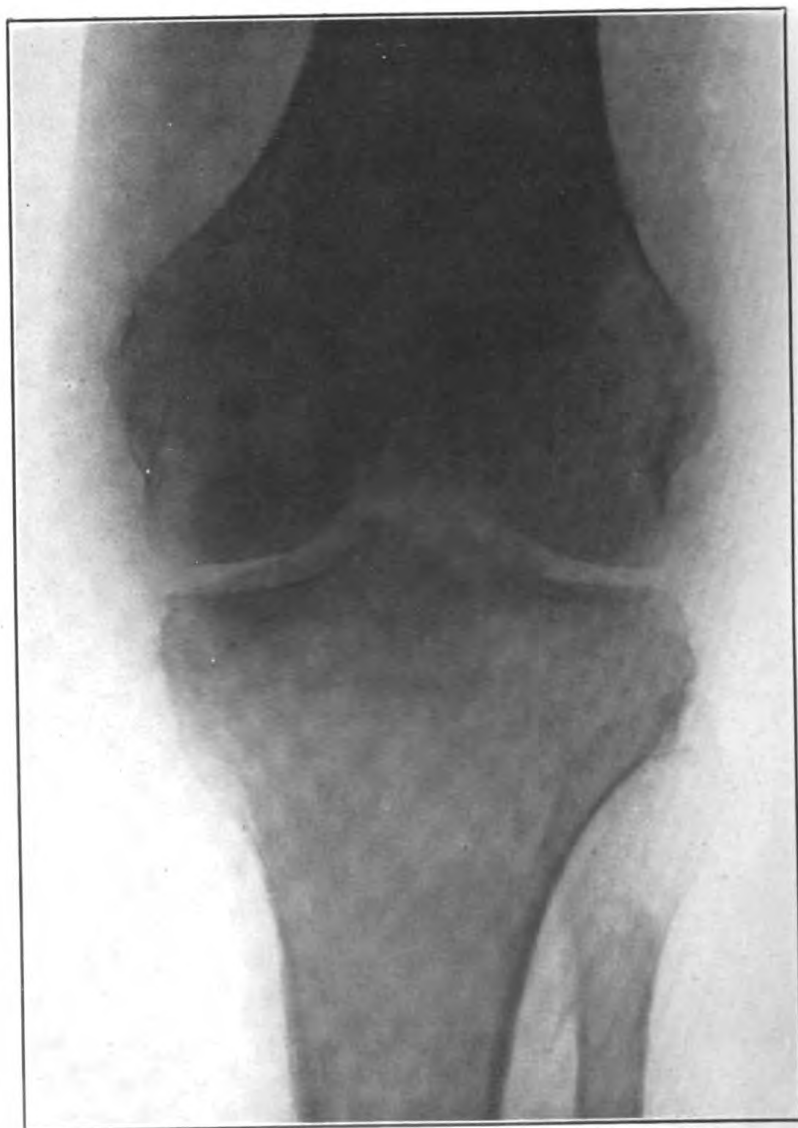


Fig. 2.—Chronic Infectious Arthritis, Gonorrheal.



Fig. 3.—Chronic Infectious Arthritis, Tuberculous.

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Fig. 4.—Caries Sicca.



Fig. 5.—Chronic Infectious Arthritis, Luetic.

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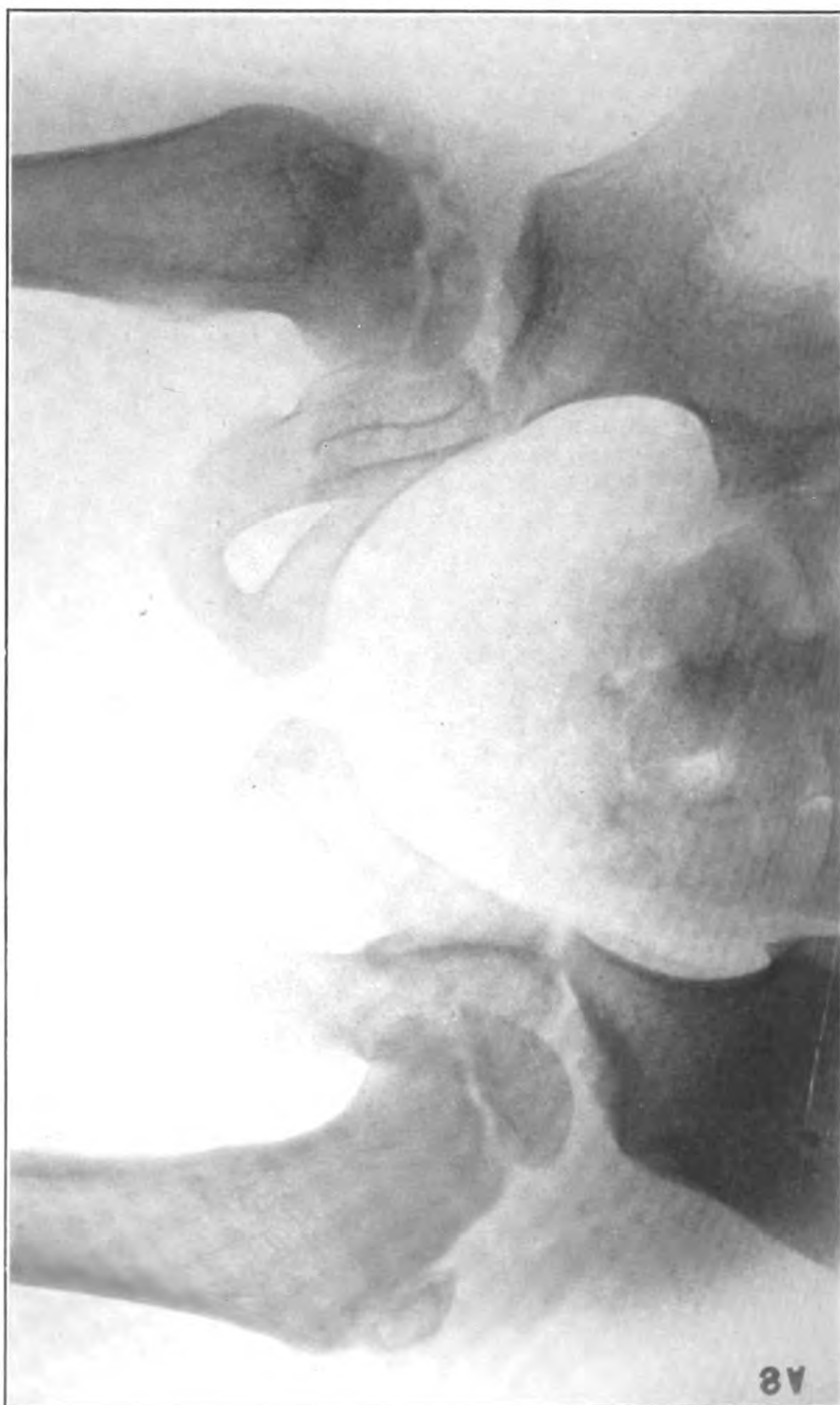


Fig. 6.—Osteochondritis Deformans.

genic infection ensues, when periosteal proliferation may be seen about the shafts adjoining the diseased joint.

When healing occurs, any degree of destruction of the epiphysis may be seen, with bony ankylosis as the ultimate outcome. In cases of long duration, irregular deposits of calcareous material may be evident in soft tissue abscesses in the vicinity of the diseased area.

In the spine the process attacks the intervertebral disks and adjacent margins of the vertebral bodies with more or less destruction and collapse of the bodies, resulting in the formation of a kyphosis. Due to perivertebral abscess, fusiform swellings may be seen at the level of the affected vertebræ, particularly if the lesion is above the diaphragm. Calcification occurs in these abscesses as described above in connection with other joints.

The following points are useful when differentiating tuberculous arthritis of the spine from nontuberculous arthritis of the spine. In tuberculous cases there is angulation, with usually a posterior deformity, according to the location of the lesion; no bone production occurs unless there is a mixed infection; obliteration of the joint space and involvement of the body; and it occurs most frequently in children and young adults. In nontuberculous cases there is no angulation; there is bone production; no obliteration of joint spaces and no body involvement; and it occurs at any age according to the type of infection.

Caries sicca is most commonly seen in adult shoulders after 40 years of age. It is characterized by destruction of the joint cartilage, without any soft tissue swelling, effusion, or decalcification. The head of the affected bone gradually disintegrates, producing the appearance shown in Figure 4. Baetjer and Waters state: "The soft tissues have become so atrophied that the curve of the shoulders disappears completely, clinically simulating a subluxation. The synovial membrane has also contracted; consequently the head of the bone is pulled high up in the glenoid fossa."

Walkey says that frequently the actual diagnosis of tuberculous arthritis can be made without the X ray, and in some instances earlier by clinical methods than by radiogram, yet there is no other method which shows the exact location, the extent, and intensity of the morbid process. He says to be cautious of a negative X-ray finding in early cases because the early pathologic processes may not be present to such an extent as to be reproduced on the plate. Also, that frequently by the X ray the nontubercular nature of the lesion can be established and that the X ray is often decisive in cases clinically tuberculosis.

Rogers, after studying 100 cases of tuberculosis of the knee joint in adults, writes as follows: "As far as our clinical evidence goes we

have never been able to observe any bone lesion or focus within the first year of the onset of the symptoms, except in one case." As a conclusion, he states, "That an exact diagnosis is often impossible within the first year of the disease without an exploratory arthrotomy."

Sever and Fiske, writing of tuberculosis of the knee joint in childhood, say: "An examination of the X-ray plates of 120 cases showed an epiphysitis in 90 cases, or 75 per cent, of which 8 showed increased radiability and enlargement of all bones of the joint. * * * There was bone atrophy noted in 59 cases, or about 50 per cent."

Ely, writing of joint tuberculosis, says: "The roentgen picture is exactly what one would expect. The bone shows rarefaction in irregular areas. It has a 'worm-eaten' appearance. The cartilage is usually thin and eroded in spots." In another article on this subject he states: "An absolute diagnosis can not be made clinically."

Bowman, writing of coccidioidal granuloma, says: "The roentgen findings in all these cases to my mind greatly resembled those of tuberculosis, the peculiar irregular, fuzzy appearance of the periosteum being the only distinguishing feature. It may be well to bear in mind in the future when dealing with suspected tuberculosis of bones or joints that possibly it may be a case of coccidioidal granuloma, and I trust that further investigation will assist materially in aiding us to make a definite positive roentgen diagnosis of this disease."

Luetic arthritis.—Luetic arthritis occurs at any age, and one or more joints may be involved. In suspected cases, in addition to the roentgenogram of the joint, it is well to make pictures of all the long bones for evidence of a syphilitic periostitis.

A roentgenogram of a typical luetic joint shows marked periarticular swelling with thickening of the synovial membrane and fluid in the joint. There is generally a small area of periostitis at the chondro-periosteal junction. According to Baetjer and Waters, "This periostitis, in conjunction with periarticular swelling and fluid in the joint, is fairly characteristic of a luetic lesion." The roentgenogram only records the exact size of gummatous deposits which are ossified. Holmes and Ruggles, in writing of this disease, say: "Occasionally syphilis is indicated by destruction of articular surfaces, particularly those of the small bones, such as carpus and tarsus, and by local lesions in the epiphyses suggesting tuberculous foci." (See fig. 5.)

Blythe, writing of the diagnostic value of X rays in joint diseases, says that early syphilis can not be differentiated from multiple arthritis, but syphilitic joints give a fairly characteristic picture. Wallace, writing of the diagnosis of syphilis of bones and joints, says, "In many of our cases the Wassermann reaction was negative, and they

were undoubtedly syphilis, as shown by the X ray, and their response to antisyphilitic treatment. * * * We consider the roentgenogram the most valuable factor in the diagnosis of syphilis of bones and joints in differentiating it from other conditions. * * * In our cases we have not found syphilitic arthritis without bone involvement, as the roentgenogram of the joint involved may show nothing, while a roentgenogram of other bones or those contiguous to the joint may show a typical syphilitic osteoperiostitis. In one of our cases where the knee was complained of, a roentgenogram showed typical syphilitic involvement of the radius and ulna." Ely relies upon the therapeutic test in suspected cases where the Wassermann test is negative, and says:—"It is this difficulty in diagnosis which is responsible for the many 'cures' of joint tuberculosis, and for the former vogue of iodide of potassium in so-called chronic rheumatism." He believes this disease occurs with great frequency, and in obscure cases we should look for other evidences of syphilis. Roberts says that 51 cases out of 200 bone and joint cases had been diagnosed as tuberculosis and treated as such for a few months to 15 years, and "In a series of 50 of the cases the Wassermann reaction was so frequently negative in the face of other evidence of syphilis and satisfactory therapeutic results that it may be said that in the late manifestations of inherited lues it is only occasionally of value."

Osteochondritis deformans.—Osteochondritis deformans Legg's or Perthes' disease, is a disease which clinically somewhat resembles tuberculosis of the hip joint, but does not react to tuberculin. It occurs most frequently between the ages of 4 and 12 years. It is readily diagnosed by the roentgenogram and is characterized by an increase in density and flattening of the head of the femur. The epiphysis is occasionally separated into several masses and the neck is broader than normal, with a slight coxa vera. (See fig. 6.) There is no hazing or clouding of the joint such as is found in tuberculosis. The acetabulum is not involved, unless later by mechanical changes in the head of the femur. Usually only one hip is involved; but Giles states that it can occur bilaterally with abatement of symptoms after one to two years.

The cause of this disease is unknown. Holmes and Ruggles state, "It is possibly due to interference with the blood supply of the epiphysis." Giles uses the synonym "Calve's disease" and believes it is produced by an injury. Delitala believes it is caused by a congenital alteration of the epiphyseal cartilage of the upper end of the femur or the epiphyseal nucleus, which gives way to processes of ossification which are insufficient and irregular. Roberts believes it is the result of inherited syphilis. Phemister says: "I believe

Perthes' disease is an infectious process from the histologic examination of the excised tissues."

Reiley, in reporting four cases, says: "The fact that two of these cases had been previously diagnosed as tuberculosis of the hip joint, emphasizes the importance of careful differential roentgen diagnosis in all cases of hip-joint disease."

The roentgenologist's report.—The report of a roentgenologic examination should avoid the use of technical roentgenology. This is an ideal form coming from one roentgenologist to another. Although it should not be assumed that the internist or surgeon is entirely unskilled in weighing roentgen-ray evidence, it is wise to assume that he is not familiar with the finer points in roentgen diagnosis. It should enable the clinician to visualize a fluoroscopic examination as though he had been present or to observe the points of interest on the film in a comprehensive manner.

The roentgenologist may be able to differentiate the various forms of chronic infectious arthritis to a fairly accurate degree and should endeavor to place in the hands of the clinician any information that might be of value. His report may have direct bearing upon the etiology, treatment, and prognosis of the case. Whenever it is possible, a conservative estimate should be made of the activity or clinical importance of the pathologic changes shown upon the screen or roentgenogram. Often urinary calculi are discovered in the course of an examination of the spine or metastatic carcinoma in an examination of the sacro-iliac joint.

The clinician should consider the radiological report in the same manner as he would the other laboratory reports. He should give all information at hand concerning the case to the roentgenologist, whose report should enable the clinician to correlate the roentgen-ray signs with the clinical aspects of the case. Furthermore, the clinician should remember that the removal of the point of entry for bacteria, if it can be located, will have little influence upon the joint condition as it already exists. After the microorganisms enter the blood from the infected tonsil, teeth, etc., their connection with the original focus of infection ceases, and the infectious arthritis must be treated in addition to removing the original point of entry if it can be found.

CONCLUSION.

1. The use of a constant technic in making radiograms of joints will often eliminate errors in diagnosis.
2. There is need for a standard classification of the various forms of chronic arthritis.

3. Some authorities believe infection is the etiological factor in all forms of chronic arthritis. Up to the present time this fact has not been satisfactorily proven.

4. There are certain roentgenological findings which enable the roentgenologist to differentiate to a fairly accurate degree the various forms of infectious arthritis.

5. The roentgenologist's report should include all roentgen-ray evidence, avoiding the use of technical roentgenology, in order that the clinician may correlate the roentgen-ray signs with the clinical aspects of the case.

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REPORT OF AN ANTIMALARIAL CAMPAIGN CONDUCTED BY THE MEDICAL OFFICERS OF THE FIRST BRIGADE, UNITED STATES MARINES, IN HAITI.

By A. H. ALLEN, Lieutenant Commander, Medical Corps, United States Navy.

Haiti is a tropical island, in the West Indies, one-third of which is occupied by the Republique d'Haiti, the other two-thirds being occupied by the Republic of Santo Domingo. It is a mountainous country, one peak having an altitude of 6,000 feet. It possesses a fertile soil, rather abundant rainfall, and has numerous small rivers, or streams. The Republique d'Haiti is densely settled by over 2,000,000 negroes. Their average of intelligence is low, the majority being very little above savagery. During the French occupation, which terminated in 1804, it is estimated that, in one year, over 25,000 French troops died of yellow fever and malignant malaria. At present, yellow fever is absent, but malaria infections are almost universal.

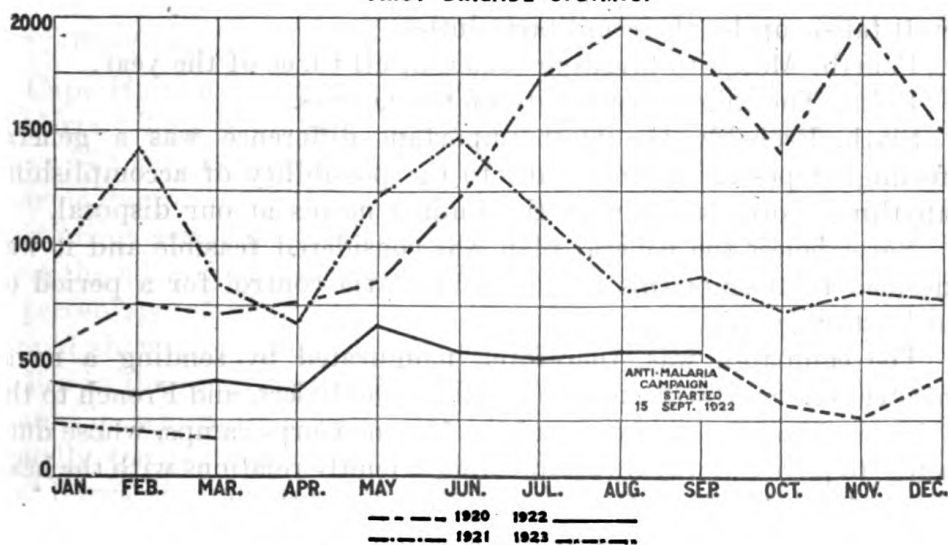
Among the natives, due to long years of revolution and internal disorder, conditions in 1915 became so chaotic that the United States was compelled to intervene in political affairs and accordingly landed an expeditionary force of marines to pacify the island and to allow some sort of order to be established.

From the beginning of the occupation until recently malaria has caused the greatest number of sick days and deaths in the marine brigade. A glance at the accompanying chart showing the number of admissions per thousand for malaria during the years 1920, 1921, and 1922 graphically illustrates the high rate of disability caused by the disease. The marines, in order to perform their mission in Haiti, were compelled to patrol the entire area of the Republic. This necessitated forced marches for days over mountain ranges, long periods of garrisoning isolated hotbeds of brigandage or revolution, and in general subjected them to the hardships of a guerrilla warfare conducted in a tropical country. The last actual fighting occurred in 1921. Since then marines have been garrisoned in more or less permanent posts. The main stations in 1922 were Port au Prince, the capital, a seacoast city of about 80,000; Cape Haitien, the second largest city, situated on the north coast; Pont Beudet, a miserable little town about 12 miles from Port au Prince, situated on a dusty plain; Las Cahobas, an interior mountain town; Mirebalais, also an

interior mountain town but with the Artibonite River flowing past it; Maissade, situated in a marshy rice paddy; San Michel, a plains town of about a 1,300 feet altitude in the interior; Hinche, an interior town on the banks of the Guayamoke River; and smaller detachments at Grande Riviere, Ennery, Canot River, Bizoton, Bon Repos, and Hasco.

From this description it will be seen that each post presented different problems as to drainage, mosquito extermination, and malaria protection. On the establishment of these more or less permanent posts the naval medical officers on duty with the troops busied themselves with general sanitary measures such as drainage, cut-

**COMPAPATIVE MONTHLY RATE OF MALARIA
IN THE
FIRST BRIGADE U.S.M.C.**



BASED ON ADMISSIONS PER 1000, PER YEAR.

ting down underbrush near camps, filling in or oiling pools of water, etc. Despite these ordinary means and the compulsory use of the mosquito bar at night, malaria was rampant, reaching its high point in August and November of 1920 and in February and June of 1921. In some detachments the admission rate was over 4,000 per 1,000. This number of cases seriously interfered with the military efficiency of the marines and caused great expense to the Government by reason of the frequent hospitalization and frequent transfer of malignant malaria cases to the United States. During the first part of 1922 the disease became less prevalent, due to the fact that fewer fresh troops were being sent to Haiti, but in May

and June coincident with the rainy season, the admission rate again began to climb. With the approval of the Surgeon General of the United States Navy, it was decided to inaugurate a campaign against malaria conducted along the lines of that reported by C. C. Bass and his coworkers in the Mississippi Valley. Doctor Bass kindly furnished the brigade surgeon a complete set of reprints which were invaluable in inaugurating the campaign. Our problem approximated the conditions in the Mississippi Valley in some respects but differed in the following points:

First. We are dealing with 100 per cent negroes who speak no English, who are superstition ridden and densely ignorant.

Second. Haiti presents marshlands, mountain ranges, and river beds, with no railroads worth considering and with difficult problems of transportation.

Third. We have only a few medical officers, and their time is well taken up by their military duties.

Fourth. Mosquito breeding occurs at all times of the year.

Fifth. The migratory habits of the natives.

Sixth. Probably the most important difference was a general feeling of pessimism in regard to the possibility of accomplishing anything worth while with the limited means at our disposal.

Nevertheless the general plan was considered feasible and it was decided to attempt this method of malaria control for a period of at least one year.

The campaign was, therefore, inaugurated by sending a naval medical officer who spoke creole, the native dialect, and French to the various towns in the vicinity of the Marine Corps camps, whose duty it was to pave the way by establishing friendly relations with the head men of the village. He explained to them the cause of malaria, how it is transmitted, and its propagation. He pointed out the benefits which would recur to the natives if they took the advice and medicine of the doctors. He obtained as much publicity as possible and made frequent talks to representative groups of Haitians and especially to the French priests. He also requested the priests to instruct their congregations at church.

Following this advance advertising the campaign was directed as nearly as possible according to the plan of Doctor Bass as given in his article in the Southern Medical Journal of April, 1920.

In the beginning it was feared that opposition might develop on the part of the natives to blood specimens taken or that possibly some antagonism would be displayed by the native "doctor." To our surprise and gratification, the natives welcomed the examinations and were anxious to take whatever medicine was prescribed.

It was realized that permanent records would prove to be a most important feature; hence instructions were issued to keep a book containing the following information:

Name.	Sex.	Age.	History of malaria.	Residence.	Positive.	Negative.	Amount of treatment.	Recur- rence.

The following table gives the results of the first examination:

	Per cent positive.
Port au Prince area.....	20.38
Pont Beudet area.....	43.87
Mirebalais area.....	37.95
San Michel area.....	54.32
Hinche area.....	52.63

Cape Haitien has long been known for its practical freedom from malaria. This is probably due to the absence of anopheles. There were 849 smears made of natives within a radius of 1 mile of the marine camp, and only 5, a percentage of 0.58, were found to be harboring active parasites. Excluding Cape Haitien, this would give the cities a percentage of 20.38 positive and the interior towns a percentage of 47.19 positives. Including Cape Haitien, the cities would show 10.48 positive. My own idea of this difference is that it lies in the breeding habits of the anopheles, which prefers a clean water in which to lay its eggs. The standing water in cities is usually too polluted to attract anopheles.

A more accurate per cent of positives would probably be 58 for the interior towns and 30 or 40 for the Port au Prince area, as the medical officers necessarily were limited to one stained specimen and could not afford to spend more than 10 minutes on any one slide. The usual parasite is benign tertian, yet many smears show the red cell to be normal in size or somewhat smaller and to contain very fine, hair-like ring forms.

A disposition to call these malignant forms was noted. Crescents are fairly common. The great majority of natives examined seemed to be in good health, but all gave a positive history of fever at some time.

They seem to have established a great immunity; for example, one mother, 18 years of age, and her 3-months-old infant presented a picture of perfect health, the baby being a well-nourished, active child, yet the specimens from both mother and child showed numerous crescents. The mother stated that the child had never been ill.

An attempt to estimate the amount of malaria by the "splenic index" was abandoned, as even active carriers showed no enlargement of the spleen.

Bearing in mind that the work was necessarily limited to natives living within 1 mile of a marine camp and that it was being done solely as a prophylactic measure for the marines, the results for the months of October and November were awaited with great interest. If our theory that infection occurred generally within a limited zone was correct, a marked reduction in the number of cases occurring in the troops should show within two months. The first report, that of October, 1922, showed 43 admissions, a rate per thousand of 300, the lowest rate since marines had landed in Haiti.

The next month, November, showed only 37 admissions, which further confirmed us in believing that results were being demonstrated.

Comparing the actual number of malaria cases in the marines for the seven months of the previous years corresponding to the seven months this campaign has been under way we have the following figures: Seven months, 1921-22, 687; seven months, 1922-23, 237. This shows an actual decrease of 450 cases of malaria in the marine brigade. If these figures were carried back to 1920 and 1919 the reduction would be still more striking.

The cost of treating natives by giving them quinine is estimated to be \$0.756 per person at the present United States Navy price of the drug. This allows a full period of eight weeks and 10 grains dosage.

The gain in reducing the incidence of malaria in marines is hard to estimate in terms of dollars and cents, but the gain in military efficiency is obvious.

This campaign is still being prosecuted by the medical officers of the First Brigade, and efforts are being made to interest the sanitary authorities of Haiti in order to enlarge its scope.

The effect, in the natives themselves, has been remarkable. For example, in the town of Pont Beudet, it was formerly usual to find a dozen or so fever cases lying on the floors of their shacks, and many men were unable or unwilling to work. For the past four months no fever cases have been reported there, and most of the males have gone to work on the near-by sugar plantation.

From the work of the naval medical officers on duty with the First Brigade of marines the Haitian peasant has learned to look upon the military doctor as a wise counsellor and to regard the military occupation as a boon to Haiti.

CONCLUSIONS.

1. It is possible to reduce malaria in a highly malarial country by the administration of quinine as described by Bass, even though restricted to relatively small areas.

2. The results of an eight months' campaign in Haiti, although limited in scope, are of proven value.
3. The cost is negligible in view of the benefits derived.

THE MALARIA PARASITE IN HAITI.

By R. B. STORCH, Lieutenant, Medical Corps, United States Navy.

Considerable discussion and doubt has been caused as to the identity of many malaria parasites found in blood smears in Haiti, especially those of native Haitians. Ring or hyaline forms are found which do not correspond exactly to the classic descriptions of any of the three forms of the plasmodia of malaria. These forms are declared to be *Plasmodium vivax* by some, and by others are just as firmly pronounced to be *Plasmodium falciparum*. It is true that these forms are smaller than we are accustomed to find in an attack of benign tertian malaria, and yet they are not typical of the æstivo-autumnal type.

If we view our laboratory findings in the light of clinical manifestations we must, most certainly, make our diagnosis infection by *Plasmodium vivax*, for a large majority of the malaria not only among marines, but among Haitian natives, is typically benign tertian with fever every other day, or occasionally every day (indicating a probable double infection).

The value of the microscopic picture depends greatly upon the stain used. A stain to be satisfactory for general use should not require unusual skill or care, and yet should assuredly be polychrome, in order to make a clear differentiation of cell, ring, chromatin, and pigment. The Romanowski stains, viz, those of Wright, Giemsa, and Balch, meet such requirements, the simplest being the Balch stain. There has been some objection to Balch's stain on the ground that differentiation is far less clear than with Giemsa's stain and that many organisms are thus missed. If directions are properly followed this is not true. A great many unsatisfactory Balch stains are due to not allowing the stain to set a full 48 hours after the ampule is broken. The facility and ease of using this stain and the clear microscopic picture seen in a properly stained smear make it preferable to the Giemsa for general use.

A new stain known as "tetrachrome" has recently been in use at the field hospital of the First Brigade, United States Marines, and is as easy to use as the Balch stain, but gives a far clearer differentiation, and is especially excellent in the staining of chromatin.

Such stains as borax-methylene-blue are not believed to be satisfactory for general malaria work because of lack of differentiation. With such a stain it is easily possible to miss the diagnosis in an

obscure case, or one where very few parasites are present in the blood stream.

It would seem safe to make a diagnosis of infection with *Plasmodium falciparum* only—

- (a) When more than one delicate ring is present in a red blood cell;
- (b) When such a ring appears to protude from the red blood cell; or, best of all,
- (c) When the crescent is present.

There are other points, however, which if borne in mind will enable us to decide definitely upon the type of parasite even though we find only a single ring form. The red corpuscle in benign tertian malaria is enlarged and lighter staining than normal; furthermore we find Schüffner's dots which are characteristic only of this type. In the quartan type the red corpuscle is normal in size and staining, whereas in the æstivo-autumnal type it is slightly smaller and shrunken and the edges are frequently crenated; then, too, Maurer's spots are occasionally found which are characteristic of this type.

The ring form of *Plasmodium vivax* is oval, about one-fifth the size of the red corpuscle, and resembles a signet ring. The chromatin is single and in line with the ring, often appearing as a blue dot between the points of a new moon, the whole being situated in the center of the cell and usually single.

The quartan ring resembles the benign tertian ring, but is thicker; diagnosis, however, should be based upon equatorial bands, which tend to appear early and are unmistakable. Chromatin is less dense.

The ring form of *Plasmodium falciparum* is small, delicate, and hair-like, usually about one-sixth the size of the red corpuscle. Chromatin stains more deeply and sometimes appears as two dots, but the important differential point is the fact that it protrudes from the ring instead of being set in line with it, as in *Plasmodium vivax*. Rings are eccentrically placed, more than one are often noted to a cell, and have been aptly described as "appearing to be plastered upon the outside of the red blood cell." They often appear to protrude from the cell.

With these facts in mind, it is hardly possible to be in doubt as to the identity of a parasite, or to confuse *Plasmodium falciparum* with *Plasmodium vivax*. It has been my experience that a ring form of benign tertian malaria may frequently be smaller in this country than we have been accustomed to see, but that it nevertheless conforms to the specifications of *Plasmodium vivax*.

The accompanying chart was prepared at the suggestion of the brigade surgeon for the use of the medical department of the First

Brigade, United States Marines, as a guide for the identification of the various forms of the plasmodia of malaria.

A differential table of malaria parasites stained by Romanowski method.

	<i>Plasmodium vivax.</i>	<i>Plasmodium malariz.</i>	<i>Plasmodium falciparum.</i>
Red blood cell:			
General appearance.....	Enlarged; washed-out appearance.	Size and staining normal.	Slightly smaller and shrunken; edges crenated.
Schuffner's dots.....	(+)	(-)	(-).
Maurer's spots.....	(-)	(-)	Occasional.
Melaniferous leucocytes.....	(¹)	(¹)	(¹).
Young schizont:			
Ring.....	Oval signet ring about one-fifth size of red blood cell.	Thicker.....	Round, hair-like, delicate, about one-sixth size of red blood cell.
Chromatin.....	Single; in line with ring.	Less dense; may appear as clump of granules.	Sometimes two dots; stains more heavily; protrudes from ring.
Equatorial bands.....	(-)	Appear early.....	(-).
Situation in cell.....	Center.....	Center.....	Eccentrically placed; appear to be pasted on outside of cell; may appear to protrude.
Number in cell.....	Usually single.....	Usually single.....	Frequently more than one to a cell.
Immature schizont:			
"Figure eight".....	(+) three-fourths size of red blood cell.	(-)	Not usually seen in peripheral circulation.
Chromatin.....	Single, but more irregular.	Divided.....	Do.
Equatorial bands.....	(-)	(+)	Do.
Mature schizont:			
Form.....	Irregular.....	Oval.....	Not seen in peripheral circulation.
Chromatin.....	Beginning to break into granules.	Divided.....	Do.
Pigment.....	Evenly distributed throughout.	Coarse, peripheral.....	Do.
Merozoite:			
Form.....	Mulberry (Stitt).....	Daisy (Stitt).....	Rarely in peripheral circulation.
Chromatin.....	Irregular division into 16 to 20 merozoites.	Regular division into 8 to 10 merozoites.	Do.
Pigment.....	Clumping in center or periphery.	Central block.....	Do.
Macrogamete:			
Form.....	Round.....	Round; smaller.....	Crescent, long and narrow.
Chromatin.....	Eccentric; small in amount.	Peripheral.....	Scanty, central compact.
Pigment.....	Abundant; coarse.....	Heavy, especially peripherally.	Central ring around chromatin or clumped in center.
Microgametocyte:			
Form.....	Round.....	Round.....	Shorter and broader than macrogamete; kidney shape.
Chromatin.....	Abundant; central or band.	Central.....	Diffused network.
Pigment.....	Less amount.....	Less than macrogamete.	Scattered throughout.

¹ Presence of melaniferous leucocytes suggests diagnosis of chronic malaria even when parasites of malaria are not demonstrable in the blood.

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SAMOAN CONJUNCTIVITIS: A STUDY OF THE CAUSATIVE ORGANISM.

By D. HUNT, Lieutenant Commander, Medical Corps, United States Navy.

In 1830, according to the writings of the early missionaries, a purulent ophthalmia was prevalent throughout Samoa and other South Sea islands, and during certain parts of the year, the bread-fruit or fly season, it occurred in epidemic form.

There is no record of its existence prior to this time, but from Samoan history, handed down from generation to generation, it is believed that its appearance in Samoa dates from contact with the Caucasian. Samoan conjunctivitis is known as "ma'i mata," sick or sore eyes.

Gonorrhœa, according to the writings of the early missionaries, was very prevalent throughout the South Sea islands in 1796. It was thought that its occurrence was very rare in Samoa, yet recent investigation shows that gonorrhœa is not uncommon. Most Samoans know what gonorrhœa is and call it "ma'i afi," disease of fire. A Samoan will not voluntarily report to a white doctor for any venereal disease but seeks treatment from a native "doctor."

Rossiter, in 1908, made an investigation of Samoan conjunctivitis. He described the causative organism as a gram negative diplococcus that grew well on the usual culture media, and one that had been hitherto undescribed.

Cottle, in 1910, believed that a great number of these cases were trachoma. He stated: "The presence of a granular eyelid disease in a population with thickened lids, cases of trachoma-like ptosis, a few of pannus, some of old adhesions between ocular and palpebral conjunctiva, old opacities of the cornea, are signs which before coming to Samoa would to me have meant the undoubted existence of trachoma. However the presence here of an eye disease called acute conjunctivitis (Samoan) by my predecessor (Rossiter) is a factor as yet not entirely known. It was his tentative opinion, expressed in a report dated May 8, 1908, that some of the conditions noted above were late stages of untreated Samoan conjunctivitis. A longer period of observation than he had is necessary before this tentative opinion can be either supported or denied."

Leber and von Prowazek describe a disease, epitheliosis desquamativa or Samoan eye disease, in which the symptoms begin with pain, photophobia, and livid coloration of the upper and lower lids, while a milky secretion is poured out, which is composed at first of epithelial cells only, but may become purulent. They consider the causative agent to be a chlamydozoon, *Lyozone atrophicans*, Leber and von Prowazek, 1911. They state that they studied 75 cases and that the disease was conveyed to guinea pigs.

While we have seen many cases that presented the same symptoms as described by Leber and von Prowazek, yet we have been unable to find the causative organism as described by them and in every acute case have found a gram negative diplococcus.

In a recent survey of American Samoa there were 168 cases of conjunctivitis found, all of whom were treated. Several years ago, during the breadfruit season, over 50 per cent of the population had conjunctivitis each year. In this survey there were 454 found to be blind, 86 being totally blind in both eyes, in a population of 8,184.

For the past two years there have been no epidemics of conjunctivitis which could in any way compare with previous epidemics, either in the number of cases or the severity of infection. The symptoms of these cases varied with the severity of the infection but for the most part were similar to those of gonorrhœal ophthalmia but in general less severe. Cases treated early have responded well to treatment and no complications have resulted. Neglected cases were frequently observed which showed the same complications one might expect from gonorrhœal ophthalmia. The cornea was most commonly involved and all stages of involvement were noted, from the dull generalized cloudy cornea to circumscribed infiltrations and ulcers. Annular abscess and complete destruction of the cornea never occurred in cases properly treated. However there are plenty of cases in these islands that show the results of such complications, likely due to neglect or meddlesome treatment. Chronic keratitis still exists as a sequel of former epidemics. In two years we have treated only one case of pan-ophthalmitis and one case with hypopyon. Cases of iritis and irido-cyclitis have been brought to the hospital for treatment (late in the course of a severe conjunctivitis) which did well under proper treatment. Non-vascular opacities of the cornea are very common and are probably the result of a severe conjunctivitis which occurred during a former epidemic when the severity of infection was greater than it is now, or the opacity could be due to a conjunctivitis of recent origin and neglected or treated in the Samoan fashion. Among the cases treated by the naval medical officers, perforation of the cornea never occurred. Total staphyloma is frequently seen in children and occasionally in adults. The eye is permanently blind, the mass consists of iris and aqueous, and the intraocular tension is increased. Many atrophied eyes are seen on every hand which could be the result of a spontaneous cure effected through the rupture of a staphyloma.

During the past two years several hundred smears have been taken from cases of conjunctivitis, and in all cases a small gram negative diplococcus was found.

In order to make a study of the causative organism, two cases were selected from children suffering from conjunctivitis where the possibility of infection from a case of gonorrhœa could be ruled out. The discharge from the eyes was plated on blood-streaked peptone agar and on peptone agar. Within 24 hours small grayish moist opalescent colonies developed. On microscopical examination they were found to be gram negative coffee bean shaped diplococci and considerably larger than the smears from the eye showed. They were obtained in pure culture. There two cultures, Culture I and Culture II, were morphologically and culturally the same.

Three cases were selected, two volunteers and one prisoner, for experimental purposes.

Case I. A., female, age 18, was placed in isolation for several days before the experiment. On December 25, 1922, some cultural material from Culture I was implanted in the left eye. On December 26, 1922, 24 hours later, a well-developed conjunctivitis was present in the left eye. A culture, Culture III, was taken on peptone agar. A gram negative coffee-bean shaped diplococcus was obtained in pure culture. The conjunctivitis responded readily to treatment.

Case II. S. K., male, age 17, was placed in isolation on December 8, 1922. He gave a negative history for gonorrhœa and repeated examinations were negative. On December 23, 1922, some cultural material from Culture I was implanted in his urethra. On December 28, 1922, a slight redness of the meatus was noticed. On December 30, 1922, a slight muco-purulent discharge was present. A culture, Culture IV, was taken on peptone agar and a gram negative coffee bean shaped diplococcus was obtained. On January 3, 1923, discharge was still slight and muco-purulent. Smears showed only extra-cellular gram negative diplococci. Treatment was started. On January 16, 1923, shreds were present in both glasses of the two glass tests. A muco-purulent exudation was obtained on massage of the prostate in which both intra and extra cellular gram negative diplococci were found. On January 30, 1923, was discharged as cured.

Case III. M. V., female, age 17, gave a negative history for gonorrhœa and repeated examinations were negative. On December 28, 1922, some cultural material from Culture II was implanted in the vagina. On January 2, 1923, there was a purulent discharge present. A culture, Culture V, was taken on peptone agar. A gram negative diplococcus was obtained. Smears showed both intra and extra cellular gram negative diplococci. On January 30, 1923, was responding readily to treatment.

Cultures I, II, III, IV, and V were morphologically and culturally the same. They died out within five days unless trans

planted. Owing to the absence of material it was only possible to grow them on two sugar medias, dextrose and maltose agar. They all produced acid within 24 hours on the dextrose media. All the cultures were faintly acid on maltose media within 24 hours. The maltose used had been on this station for several years, and the media was autoclaved for 15 minutes at 5 pounds. This could readily account for the slight acidity produced on the maltose media.

CONCLUSIONS.

1. That Samoan conjunctivitis is due to a gram negative diplococcus.

2. From the early prevalence of gonorrhœa in Samoa and the above experiments it is believed that the gram negative diplococcus that causes Samoan conjunctivitis is an attenuated form of the gonococcus.

BLACKWATER FEVER.

By G. E. ROBERTSON, Lieutenant Commander, Medical Corps, United States Navy, and
W. MOORE, Lieutenant, Medical Corps, United States Navy.

Much work has been done and many articles written on the cause and treatment of blackwater fever and as yet no definite conclusions have been reached. A great deal of this work has been of a very scientific nature and the observations of men with wide experience. Our object is only to present our convictions as to the cause and treatment of hæmoglobinuric fever after two and one-half years' experience in Haiti.

During this time 626 cases of malaria and 13 cases of blackwater fever have come under our observation. When we say blackwater fever we mean those cases that actually pass black water and which laboratory tests verify as hæmoglobinuria and not those cases in which delicate laboratory tests are needed to demonstrate the presence of hæmoglobin in the urine.

All the blackwater fever cases in our series showed malarial parasites in the blood or had a record of having had malaria within the past 12 months. All cases in which we were able to demonstrate parasites at the time of the attack of hæmoglobinuria showed *Plasmodium falciparum*. In addition to hæmoglobinuria, all the blackwater fever cases had symptoms of shock, persistent vomiting, jaundice, and increasing anemia.

Since the American occupation in Haiti certain sections of the country have been notorious for the number of cases of blackwater fever occurring among the service personnel. Invariably these localities have been the ones in which the largest amount of damage has been by reason of malarial infection and the largest number of

cases of æstivo-autumnal malaria have been found. In the early days of the occupation (1915-16), records show that troops serving in northern Haiti in the district around Fort Liberty and Ouanaminthe had to be replaced frequently because of the prevalence of malignant malaria and blackwater fever.

During our residence in Haiti the above district has not been occupied. The region about Mirebalais, which is 35 miles from Port au Prince, where marines have been stationed during the past two and one-half years, has been known as a district in which malignant malaria and blackwater fever has been endemic. Also, Biziton, a town 3 miles from Port au Prince, where the air squadron and sub chaser division were stationed, has the same reputation. Of the 13 cases of blackwater fever which we have seen, seven cases came from Biziton and 4 from Mirebalais. One year ago all service personnel was removed from Biziton and since that date no blackwater fever has occurred among those divisions. The malaria has practically been eliminated also.

The number of cases of blackwater fever has shown a definite relation to the number of malarial admissions. December has always shown the greatest number of malarial patients and also of blackwater fever.

We observed two cases of blackwater fever in individuals who had never taken any quinine and who had abundant *Plasmodium falciparum* in the blood at the time. One of these cases was in a native Haitian who had never been out of the country and the other in a white woman who had resided in Haiti for four years. The latter case gave a history of repeated attacks of blackwater fever, at least four.

During the first year, six cases of blackwater fever were treated. Those showing positive malarial smears were given intravenous quinine (10 grains of the hydrochlorosulphate) until the temperature remained normal and the urine cleared. After this time quinine was given in 10-grain doses daily by mouth for eight weeks. Those in which the parasites were not found were treated by alkalies and subcutaneous injections of horse serum. The last case admitted in 1921 gave a history of frequent attacks of malaria during his 10 months' duty in Mirebalais, but no parasites were found in his blood during his stay in the hospital. He was treated with alkalies and horse serum until his red blood count was 1,030,000 and death seemed imminent. At this stage of the treatment intravenous quinine (10 grains of the hydrochlorosulphate, daily) was instituted and from then the improvement was rapid. Since that time six cases have been treated and the routine has been intravenous quinine, 10 grains daily, until the temperature remained normal and the urine was free from hæmoglobin.

There were no deaths among the blackwater fever cases and improvement on quinine treatment was almost immediate. Certainly there was no evidence that the quinine increased the hæmoglobinuria.

We came to Haiti believing that quinine was one of the causes of blackwater fever and for that reason we did not use the drug our first year in cases that did not show malarial parasites in the blood at the time of the attack of hæmoglobinuria. We know from actual experience that quinine does not kill these patients and do believe it is the logical form of treatment.

In conclusion, it is our belief that blackwater fever is a manifestation of pernicious malaria and should be classed along with the cerebral, algid, bilious, remittant, and other forms of pernicious malaria. We also believe that the administration of intravenous quinine is the most important remedy for its cure.

PERSONAL EXPERIENCES WITH MALARIA AMONG NATIVES OF THE REPUBLIC OF HAITI.

By R. B. STORCH, Lieutenant, Medical Corps, United States Navy.

The Republic of Haiti occupies roughly the western third of the island known variously as Haiti, St. Domingo, and in early times as Hispaniola. The eastern section of the island is occupied by the Republic of St. Domingo, an entirely separate and distinct country. The Republic of Haiti was founded in 1804 under the leadership of Dessalines, Christophe, and Petion, whose forces won their independence from France. The early struggles for independence were led by the famous negro, Toussaint Louverture. To quote from one of the early decrees of Dessalines, the first President, "the Republic of Haiti shall be a free and independent country, and its subjects shall be known as blacks." The official language is French, though the great mass of people speak a patois which only slightly resembles French.

The island is situated between Porto Rico on the east and Jamaica and Cuba on the west, extending 140 miles in breadth from north to south and about 400 miles in length from east to west, and lies in latitude $18^{\circ} 20'$ north, and in longitude $68^{\circ} 40'$ west from Greenwich; of coral formation, the contour is extremely mountainous, many peaks rising to a height of 4,000 feet and others often rising directly from the sea. On the tops of many ridges 2,000 or 3,000 feet above sea level may be found oyster shells and coral. There are several fairly large rivers, the largest of which is the Artibonite, which is navigable to small boats for about 20 miles from its mouth. The

climate varies in different parts of the island, but there is uniformly a rainy and dry season, although in the north and south these seasons are directly opposite. During the rainy season, which commonly begins in May and lasts till September, there are daily heavy, tropical rains, usually beginning suddenly between 2 and 3 o'clock, and lasting invariably till dark or all night. Morning rains are unusual. During the rainy season fields are flooded, rivers swollen to rushing torrents, and the roads deep with mud. Despite the tropical heat of the day, the nights are uniformly cool.

Haiti, in common with most of the southern and tropical countries, is literally a reservoir of malaria, from which it is disseminated by contact and subsequent travel to many of the more temperate regions. It is extremely rare to see any native who can not give a history of malaria fever, excluding, of course, the higher class of educated and wealthy Haitians. When we consider the Haitian native, it is the general mass of uneducated peasants who make up the great bulk of the 2,000,000 inhabitants, and may be, perhaps, best compared with the peasant class of some of the European countries, although many of the Haitian peasants, especially those of the mountainous districts, are not far removed from their African ancestors and have guarded many of the tribal traditions. We are safe, then, in placing among this class a high malaria incidence, probably very close to 100 per cent. This is necessarily relative and does not by any means indicate that all the people are sick all the time, but that a great majority of them harbor malaria parasites in the internal organs of their body, and upon any adverse condition, such as an injury, exposure to sudden cold, or prolonged exposure to rains, are prone to develop an acute attack.

At first thought this may seem an excessive percentage of infection, but when it is considered that in many communities the anopheles mosquito is present the year around, and in the rainy season is found in almost all parts of the country, and when to this is added the facts that no precautions are taken against the mosquito, and a very few cases of malaria cured, then the situation is seen in a new light.

If we wish to get a true idea of the prevalence of malaria infection among the people, such a calculation must be based upon actual blood smears from representative communities or groups, devoting our special attention to apparently well individuals. Such examinations have shown 40 to 60 per cent positives in persons having no suggestive symptoms at the time. If we find such a high percentage of apparently well individuals of the peasant class showing malaria parasites in the blood stream, are we not then comparatively safe in placing the figures close to 100 per cent, when

we include those harboring malaria parasites in the internal organs of the body but not demonstrable in the blood stream?

That we do not find more cases of individuals actually sick with an acute attack of malaria is due probably to an increased resistance or, better, a partial immunity which has been developed after generations of natives have been infected year after year, with few or no cures except where there has been contact with modern therapeutic measures, as in the larger towns. Certain it is that a white man will develop malaria fever with typical paroxysms in a community where we are hard put to it to find any native actually suffering an acute attack. Evidently, then, the parasites which are giving the native little trouble or discomfort, except under certain adverse circumstances of exposure or injury, will quickly cause a typical acute attack in the white man, who lacks the resistance or partial immunity which the black man possesses.

In a typical community of 2,000 inhabitants 0.5 to 1.5 per cent show actual acute attacks of malaria.

Every native, upon questioning, has admitted at least one attack a year; the average number of attacks, however, is three or four, and one man stated that he had 12 attacks during the year. An occasional malaise or headache is discounted, the native considering himself actually sick when he must go to bed with characteristic paroxysms.

With the advent of the rainy season there is at once an increase in the number of acute cases. This is due, indirectly, to the adverse living conditions at such times—the unavoidable exposure to the rains, the great difficulty of keeping living quarters dry, and to lowered resistance incident to minor respiratory diseases so prevalent at these times; but more directly we may parallel our cases with the enormous increase in mosquito breeding, which promptly begins at this time. Standing water remains for days and weeks along roads and in any natural depression. Frequently whole fields remain under water during the entire rainy season. Taking advantage of these floodings, the natives cultivate rice in water halfway to the knees, the effort always being to retain any collection of water rather than to drain it. Thus many areas of comparatively clean water provide promising breeding places for the anopheles mosquito, which at once sets about diligently to obtain its portion of blood and incidentally to spread abroad its quota of malaria parasites from the ever-present supply. The number of potential malaria-transmitting mosquitoes increases progressively as the season advances. Thus early in the season the anopheles mosquito is not only fewer in number but probably also a lesser percentage of these are potential malaria

transmitters, whereas later in the season it is only necessary to be bitten by an anopheles mosquito to develop malaria.

Except in a few of the largest towns, practically no measures have been taken to reduce the number of breeding places of mosquitoes. Funds are insufficient to permit the assignment of Haitien sanitary officers in each town, and since the withdrawal of the United States Marines from several of the interior towns there is no one to point out ways of improvement in sanitary conditions, for the knowledge of the inhabitant of the interior along these lines, even of the better class, is scarcely the most elemental.

Undoubtedly the higher percentage of malaria seen in interior towns as compared to the seacoast towns may be greatly accounted for in this way, for the majority of seacoast towns either have a resident physician or sanitary officer, or at least come in contact with them periodically, with consequently a more enlightened view of living conditions.

Types and percentage of malaria in various districts.—The predominating type of malaria, considering the country generally, is the benign tertian. In some communities several hundred smears fail to reveal a single case of the malignant type. There is always a tendency on the part of some to pronounce a malaria parasite *Plasmodium falciparum* when a small or delicate ring form is found, even though one only to a red blood cell. When it is remembered, however, that in many cases of malaria, where we see symptoms quite typical of benign tertian attack, that not only are the large rings of *Plasmodium vivax* discovered, but also small and more delicate forms—one to a cell—it has been considered that the only safeguard against a wrong diagnosis is to call our parasites *Plasmodium falciparum* (*a*) when more than one such delicate ring is present in the blood cell, (*b*) when such a ring appears to protrude slightly from the cell, or, best of all, (*c*) to base our opinion upon the presence of the crescent.

At the town of Bizoton, the site of the Haitien navy yard, 3 miles south of Port au Prince, a high rate of malaria infection prevails, a large part of which is of the æstivo-autumnal type. At the time when marines were located at this point practically every case showed *Plasmodium falciparum* in the blood, infection occurring from the inhabitants of this town. Anopheles mosquitoes are very prevalent in this district.

In Port au Prince, benign tertian malaria predominates, from 10 to 62 per cent of the lower classes being infected, varying with the natural differences in contour, the mountain road to Petionville, 4 miles away and 1,300 feet high, showing the least, and certain wooded sections as well as the road along the sea to Bizoton (*v. s.*) the high-

est. An examination of 800 slides shows an average of 42 per cent infection. *Anopheles* mosquitoes are not numerous, but many *Culex* and *Aedes* (*Stegomyia*) are found, as open ditches and small accumulations of water about native huts form excellent breeding places.

It should be noted, incidentally, that collections of water from stagnant pools in streams during the dry season have uniformly shown the presence of *Culex* larvæ in Port au Prince.

Pont Beudet, 12 miles northeast of Port au Prince, showed 60 per cent infection, of which 14 per cent was of æstivo-autumnal type. This community is situated in a natural plain which is covered by a network of irrigating ditches, which frequently overflow or are purposely blocked by natives, thus providing ideal conditions for the breeding of *Anopheles* mosquitoes, which are numerous at all times of the year, though more especially during the rainy season.

Mirebalais, a town of roughly 1,000 inhabitants in the interior, 34 miles northeast of Port au Prince, shows 20 per cent infected. Several streams in this locality during the dry season form a series of connected pools with only slight current and have been found to breed *Anopheles*.

Hinche, a town of 2,000 inhabitants, almost in the center of Haiti, shows a high rate of malaria infections, with a large amount of æstivo-autumnal. *Anopheles* are numerous in this section, especially during the rainy season.

In Cape Haitien, a large town on the north coast of Haiti, no *Anopheles* mosquitoes have been noted, but malaria is present because of the constant travel in and out of the town. Outside of town in the wooded sections *Anopheles* are present and the malaria rate is higher.

At St. Michel, roughly midway on the road between Hinche and Cape Haitien, 60 per cent infection was noted, 30 per cent of which was æstivo-autumnal. *Anopheles* are numerous in the rainy season.

Thus we find our highest rate of malaria infection in the interior, especially of the northern section of the Republic.

Symptoms.—An acute attack among native Haitians differs very little from such attacks among whites, except that it appears to be of lesser severity. Premonitory symptoms are less frequently noted than among whites or the better class of Haitians, perhaps because little attention is paid to vague headaches and malaise. Then, too, the native is not such a delicate mechanism as the white man, and consequently fails to react to the infection so profoundly.

It is hardly of interest to describe such attacks in detail, because of their similarity to those with which we are familiar in the white man.

Examination discloses an abdomen tender to palpation, especially in the region of the spleen, but it is exceedingly difficult to outline any enlargement, because the abdomens are almost invariably of the pot-belly type. An attempt to obtain a malaria index by splenic enlargement, especially among children, had to be abandoned because of this fact.

Native treatment.—The first thing that any native does when he becomes sick from any cause is to go to bed and shut every window and door tightly. Fresh air, to their minds, is a dangerous thing to sickness, and, furthermore, may carry with it a curse or malediction from some enemy which would bring the sufferer to an untimely end. A wet rag ("mouchoir") is wound about the head ("coller tête").¹ This habit has often enabled us to pick out a fever case and put him under treatment. Frequently a paste of macerated orange leaves is bound about the head to draw out the fever ("ouetter la fièvre"). Occasionally a piece of damp banana or plantain leaf is used ("moi mettez feuille figue ou banane") and sometimes a poultice of cow dung, although the principal use of this latter is as a dressing for wounds, according to native therapeutics.

Copious draughts of various infusions ("tisanes") are taken. These are made from almost any bitter leaves ("feuilles amères") or roots by maceration in tepid water and allowing to stand for a few hours, the decanted fluid only being used. The favorite leaves are those of the bitter orange, although those of the sweet orange are also used occasionally. No attempt is made to obtain a uniform strength in these preparations; usually a small handful of leaves is placed in an old tin can or half gourd, the leaves macerated, the container half filled with tepid water, and allowed to simmer ("moi mettez di feuilles dans 'tit-marmite avec petit-petit de l'eau et quitter li chauffer"). The resulting infusion is placed beside the sick person, who gulps down a mouthful now and then as the spirit moves him ("moi boue' li temps in temps commé moi besoin").

If such leaves are not available, strong, bitter, unsweetened coffee is taken. ("Si moi pas gagner feuilles oranges, moi fait café ampile amère.")

During the chills, ginger tea is made from the dried roots and sweetened with coarse native sugar ("rapadou"), which is little more than evaporated cane sirup. This is taken as hot as possible and the patient covered to induce sweating ("l'heure moi gagner frisson, moi boué thé gingen avec rapadou et moi couvri toute corps-moi pour qui moi capable fait sué vini").

Only the better classes have recourse to quinine medication, but even among the most ignorant mountain people the beneficial action

¹ As Haitian creole is not a written language, the words of this patois are spelled in phonetic French.

of cinchona is recognized. In certain sections of the interior, toward the north of the island, in the vicinity of Hinche and Maissade, cinchona bark ("quinquina," as the natives call it) may be obtained from the tree itself. In questioning natives about cinchona bark they all admitted knowledge of its value in malaria. ("Oui, moi connais bois quinquina, li ampile bon pour la fièvre.")

A specimen obtained from a native was a piece of a branch about 3 centimeters thick, covered by a grayish bark of a rough or warty appearance, which could readily be broken off in pieces the size of a 25-cent piece and about 2 or 3 millimeters in thickness; the inner surface was a light reddish brown. The taste was exceedingly bitter, like that of quinine. The wood itself was of very light brown and striated longitudinally. It was well-nigh impossible to break or chop the wood transversely, as it splintered up longitudinally into small pieces. This was also bitter in taste but much less so than the bark.

Natives prepare the bark for use by mascerating four or five pieces of bark the size of a 25-cent piece in clairine (the second distillate of fermented cane sirup), or in rum, and allowing it to stand over night. "Moi caller bois et tremper quatre ou cinq morceaux dans clairin ou rhum, et quitter li toute la nuit." This rude tincture is placed in a bottle and used as required. It is customary to take a small teaspoonful four or five times daily. ("Moi prend 'tit-cuiller ça, quatre ou cinq fois par jou.'")

As fever usually comes on in the late afternoon or evening, the following morning is the orthodox time to take a cathartic. Where obtainable, Glauber's salts is the favorite, but a large spreading tree grows all over Haiti, known as "Habi," on which grow curious balls about 3 inches across and flattened on the top and bottom. When ripe, these open in sections and discharge small boomerang-like seeds. The seed kernel is a light-brown grain about the size of a small tablet triturate. One of these when chewed up acts as a cathartic, giving two or three movements.

As soon as fever disappears medication is discontinued, and no attempt is made at a follow-up treatment.

Cure and complications.—It is small wonder then that malaria recurs again and again among the natives, and their continual escape from complications or a state of chronic anemia must certainly be attributed to a partial immunity which has been established during generation after generation of uncured chronic malaria. We can not lay this apparent partial immunity to a lesser activity of the infecting parasite, because these same organisms will cause a severe acute attack in the white man.

In certain areas we may find many cases which are unmistakably of the bilious-remittent type of æstivo-autumnal malaria. This is especially true in the surrounding districts near Hinche.

The cerebral type, with its striking symptoms, I have failed to note except among the better classes.

Blackwater fever, strange to say, is not frequently seen in its true form, although it is not at all unusual to see an apparently normal convalescent with hemoglobinuria. Where typical blackwater fever is present it is almost invariably fatal.

Native ideas on mosquitoes.—It is surprising to find that many natives associate mosquitoes with malaria; the French term paludism is not familiar to them, but they frequently refer to an attack of chills and fever as "fièvre moustique" or "fièvre maringuin." However, it must not be supposed that there is any definite knowledge in regard to malaria transmission to be found among these people. In the instances where the mosquito was connected with the disease it was supposed that the bite of any mosquito was apt to cause fever, because of some poison or other noxious property inherent in the mosquito, and supposed to be in some curious way connected with the stagnant pools and marshy areas where these insects abound. Great interest was manifested when told that the mosquito carried the infection from a sick man to a well man, with subsequent development of fever. The native accepts without question facts stated by anyone in authority, whom they look up to. It is perhaps for this reason that no antagonism was found to the taking of blood smears.

The life history of the mosquito is indeed a curious one if we listen to the native belief. The larva is not considered to come from the mosquito, but the adult mosquito is traced from the larva. Thus "if water is allowed to remain for several days it develops living animals." ("Si monde quitter de l'eau rester sans couler pour quelques jou', l'ap' fait bêtes.") But natives do keep their water jars covered, and when questioned all said that flies and mosquitoes might drop something in the water which would cause the appearance of "animals," yet in their minds this is not a definite connection. Although the adult mosquito is supposed to come from wrigglers, still no particular one is implicated. However, this is not to be wondered at when we think how many white men fail to implicate certain wrigglers as future mosquitoes.

Summary.—The average Haitian native appears so unutterably stupid at times as to be almost beyond belief. May we not attribute this stupidity or stolidity to generations of uncured malaria, to a human organism, which in building up a tolerance to the insidious infecting parasite, has coarsened the delicacy of its own mechanism?

When we notice the appearance of a native on a standard follow-up treatment for malaria, it is not hard to believe that a systematic and widespread effort to place natives under quinine medication where required would result in a transformation of the Haitian.

In conclusion, let us remember the following facts:

1. A high percentage of natives are infected with malaria, probably close to 100 per cent.
2. Actual examination of blood smears of apparently well individuals in representative communities has shown 40 to 60 per cent infection.
3. The number of acute attacks at any time in representative communities is 0.5 to 1.5 per cent.
4. The number of acute attacks is greater in the rainy season.
5. Benign tertian malaria predominates.
6. The interior of the northern section of the Republic has the highest percentage of infection.
7. Cinchona is recognized as a specific in malaria fever.
8. No attempt at a follow-up treatment is made.

AMEBIC AND BACILLARY DYSENTERY: A REVIEW OF RECENT LITERATURE.

By J. G. SMITH, Lieutenant, Medical Corps, United States Navy.

Dysentery has long been the problem of the military surgeon, especially so since the Spanish-American War and our advent into the Tropics. The return of our soldiers from the World War has increased its importance to the medical profession and the world at large. There was a dysentery incidence of 20 per cent among the 2,000,000 American soldiers overseas.¹

Owing to lowered standards of living, this danger from a new horde of carriers is greater in Europe than in America. Bernstein, Kling, and Rosenblatt² report that before the war "Vienna was free from dysentery." Early during the war there were frequent cases in the military hospital, but there was no epidemic among the civil population. Dysentery in epidemic form began to occur in 1917, when undernourished soldiers, discharged or on leave, prepared the soil for infection. The cases reported among the civil population are as follows: 316 cases in 1914, 150 cases in 1915, 200 cases in 1916, 2,209 cases in 1917, 2,316 cases in 1918, and in 1919 3,355 cases. There were only individual cases up to July, 1920.

¹ G. C. Kilpatrick: Prevalence of entamebic dysentery, diagnosis and treatment. *Southern M. J.* 15: 275, April, 1922.

² S. Bernstein, D. Kling, and S. Rosenblatt: Dysentery in Vienna, *Wein. klin. Wchschr.*, 34: 531, Nov. 3, 1921.

From July 1 to October 14, however, an epidemic occurred—1,439 positive cases, with a mortality of 180, or 12.4 per cent. Shiga-Kruse bacillus was the predominant infecting organism.

Amœbic dysentery.—Spolverine* says that amœbic dysentery in Italy used to be confined to a limited area in the south, but soldiers returning home from the war have scattered it throughout the entire country, and that children now have it frequently. He describes several cases in children from 2 to 12 years of age, and urges that amœbic dysentery be suspected when a child anywhere has prolonged intestinal disturbances, rebellious to ordinary treatment. In none of the children had the correct diagnosis been made, though the dysentery had lasted from six months to a year.

Great additions have been made to our store of knowledge of the spread of amœbic infections during the war, especially by the British. P. A. Buxton⁴ reports an investigation carried out at Amara, on the lower Tigris, from February to November, 1920. Flies were taken from latrines and incinerators, cook houses, and from Arab compounds. The gut of flies, containing material resembling human fæces, was examined. The female fly carried more of this than the male. The eggs of all human intestinal worms and cysts of all protozoa were found. Over 60 per cent of the flies carried fæces. In 4 per cent of them the human entozoa were found and in 5 per cent the cyst of *Entamœba histolytica*. He concludes that the fly is the major factor in dissemination of bowel disorders so prevalent in that country.

Some interesting and important statistics showing the incidence of amœbic infections among different races in different parts of the world are given by Allan.⁵ In examining about 31,000 men returned from the Near East, the majority of whom had had dysentery or other bowel disorders, 9.8 per cent were found infected with *Entamœba histolytica*. Of nearly 7,000 troops and civilians without any history of bowel trouble examined in the eastern Mediterranean area, or invalided from that region, 10.5 per cent were found infected. In 5,000 troops with a record of intestinal disorders examined in France and England, mostly troops from the western front, 8.9 per cent were found infected, while in 376 individuals without bowel trouble 5.8 per cent were infected. Kofoed found 10.8 per cent of 1,200 American soldiers returning from France infected. The great majority of these individuals received a single examination, which Dobell has shown brings to light less than one-half of the histolytica

* L. Spolverine: Amœbic dysentery in children. *Pediat.* 30, no. 1: 1-11, Jan. 1, 1922.

⁴ P. A. Buxton: The importance of house-fly as a carrier of *entamœba histolytica*. *Brit. Med. J.*, 1: 143, Jan. 31, 1920.

⁵ Wm. Allan: Review of recent work on amœbic dysentery. *Boston M. and S. J.*, 183: 545-547, Nov. 4, 1920.

infections, so that the figures given above are something less than half the true incidence of this protozoal infection. Such a brief summary may give some idea of the magnitude of the problem. Of approximately 50,000 persons examined, both in western Europe and the Near East, between 13 per cent and 25 per cent were infected with *entamæba histolytica*.

William McAdams,⁶ from a study of the results of the examination of the stools of more than 2,000 men mostly of the Mesopotamian field force invalided for various ailments to a general hospital, considers that the general protozoal infections of men invalided from active service in Mesopotamia, apart from cases of acute and convalescent dysentery, are more numerous than the record of Wengan and Dobell show to exist from troops from the eastern Mediterranean war area who have been invalided to England. He states "the incidence of histolytica among Mesopotamia troops is especially high, 13.6 per cent of 351 "nondysenteric" patients in a general hospital, and 17.8 per cent of 595 men in a convalescent depot were found in a single examination to be harboring the cysts of *Entamæba histolytica*. On applying Dobell's "appropriate figures for correction" method we find that at least 33 per cent of the troops who have been in Mesopotamia are "healthy" or "unhealthy" histolytica carriers.

Jepps⁷ made a study of 971 men at the University War Hospital, Southampton, England, from March, 1918, to March, 1919, on behalf of the medical research committee. Of this number, 527 were in the hospital with dysentery, 210 with other intestinal trouble, 2 with liver abscesses, 95 with miscellaneous complaints, and 137 had been returned from the dysentery depot at Barton-on-Sea with a variety of disturbances. In the 494 noneastern cases there were 106, or 21.5 per cent, infected with *E. histolytica*. In 478 eastern cases there were 124 infected with *E. histolytica*, or 26.1 per cent. Inference drawn from a series of cases such as this are rendered unreliable by the fact that many men had received previous treatment with emetin. The amœba dysenteriae was first described by Lambl in 1859, and subsequently by Lösch in 1875. Kartulis working in Egypt found them in stools and in liver abscesses in 1886. Osler in 1890 found them in a case of dysentery with liver abscess, originating in Panama. These early pioneers pointed the way to the light, but for years medical men have groped along rather blindly, handicapped by lack of zoological knowledge of the amœba. Protozoologists attach little or no value to early descriptions of the amœba and rightly insist that specific differences be based on methods of reproduction and on cysts,

⁶ Frank Billings, M. S. M. D.: Practical Medicine Series, 1919, vol. 1, p. 172. William McAdams, Lancet, Jan. 5, 1918.

⁷ Margaret W. Jepps: Notes on the intestinal protozoa of 971 men at the University War Hospital, Southampton. J. Roy. Army Med. Corps, 37:366, London, November, 1921.

and this in connection with pathogenicity. Schaudinn⁸ in 1903 adopted the generic name of *Entamæba* (Casagrandi and Barbagallo 1895) for the parasite in man. He described two species, *histolytica*, which he found in the stools of cases of tropical dysentery and considered the cause of this disease, and *coli*, which he found in the stools of a large percentage of normal individuals and considered nonpathogenic. Both at times occurred in the same intestine. He produced dysentery in kittens by feeding then encysted *E. histolytica*, but was unable to do so with *E. Coli*.

Fantham⁹ in a review of the literature concludes that but three species should be accepted, *E. coli*, *E. histolytica*, and *E. tetragena*, the first with eight cysts and the last with four cysts. The work of Walker in Manila in 1911 led to the narrowing down to two species, *E. histolytica*, pathogenic, and *E. coli*, nonpathogenic, the former with four cysts and the latter with eight. On this basis differentiation seemed easy, but in 1917 Wengan and O'Connor¹⁰ described a nonpathogenic amœba with four cysts, calling it *Entamæba nana*. Their work has been confirmed by British and American workers, and it has been given the name *Endolimax*, so we now have the three species to differentiate—*Entamæba histolytica*, pathogenic with four nucleated cysts; *Entamæba coli*, nonpathogenic with four unnucleated cells; *Entamæba coli*, nonpathogenic with eight nucleated cysts; and *Endolimax nana*, nonpathogenic with four nucleated cells.

The study of cysts is rapidly superseding the older method of differentiation by staining the active forms and interpreting from the amount and distribution of nuclear chromatin. The introduction of iodine stain has done much to render easy and popularize the study of cysts.

As aptly stated by Wherry, "any routine treatment of amœbic dysentery indiscriminately applied is doomed to failure." The treatment must be conducted so as to best meet conditions of the individual case. The general condition of the patient, duration, site of lesions, and the presence or absence of complications must be considered in the selection and application of remedial agencies. Studies made during the war have shown that emetine is not the specific it was thought to be by many physicians. As already brought out in this article, large numbers of patients were merely converted into carriers discharging cysts in the stools. Then, as shown, there is the large number of healthy carriers (so called) who present no evidence

⁸ Wm. B. Wherry: Amebiasis, Florchelmer's therapeutics of internal diseases, 4:119, 1919.

⁹ H. B. Fantham: On the amœbic parasite in the human intestine, with remarks on the life cycle of *Entamæba coli* in cultures. Annals of Tropical Medicine and Parasitol, 1911, 5, 111, Florchelmer's Therapeutics of Internal Diseases, vol. 4, 1919.

¹⁰ Wm. Allan: Review of recent work on amœbic dysentery. Boston M. and S. J., 1920: 545-547, Nov. 4, 1920.

of disease but who are a constant source of menace to others, and who may themselves eventually develop the disease. These cyst carriers, as well as relapsed or chronic cases, should be kept under observation and treatment until cleared up. The one notable advance in treatment since the introduction of emetine by Rodgers in 1912 is the use of emetine bismuthous iodide, which seems to afford some promise. Dumez, in Manila in 1915, first suggested its use. The British began using it the following year and have apparently demonstrated its value. In the treatment of 40 cases in a military hospital in Mesopotamia, Lambert¹¹ concludes that in carriers and convalescents, who continue to harbor cysts, that emetine bismuthous iodide should prove superior to emetine, but that it can not be considered as a substitute for emetine, as when used alone in acute cases it proved a failure. Duncan Graham¹² cleared up six cases that had resisted emetine treatment. They were given a course of double iodide of bismuth and emetine, 3 grains by mouth daily for 12 days. All cysts disappeared from the stools within 48 hours of the beginning of the treatment and remained absent for 3 weeks after the treatment was stopped, when the patients were discharged from the hospital. Allan, in a paper previously referred to in this article, gives the following statistics: Lillie and Shepherd cleared up 62 out of 104 carriers with 12-day courses of 3 grains of emetine bismuth iodide alone. Jepps and Meakins cleared up 20 out of 131 carriers. Savage and Young cured 14 out of 17 carriers and 8 out of 16 acute cases with the iodide alone, 2 to 3 grains for 12 days. Gunn and Savage, using emetine injections for 12 days, followed by emetine bismuthous iodide for 14 days, treated 120 cases; 82 were discharged as cured, 46 being kept under observation for more than 30 days, 36 for less than 30 days; 38 of their acute cases relapsed. They treated 190 carriers the same way; 171 were discharged as cured, 106 after more than 30 days, 65 after less than 30 days. Turner and Taylor in 366 carriers had 67 to clear up without treatment; 215 were cleared of cysts with emetine bismuthous iodide and 84 failed to clear up.

The results as noted above, while not conclusive, are at least hopeful. While no doubt a usefull addition to our armamentarium, only years of observation can determine the permanency of its cure.

Bacillary dysentery.--While prevalent in most parts of the world, both tropical and temperate, its etiology remained obscure until Shiga in Japan isolated the specific organism (which bears his name) in the acute epidemic form. Flexner in Manila discovered a second group, now known as the Flexner bacillus. There are sev-

¹¹ Billings: Treatment of amœbic dysentery with emetine and bismuth iodide. Practical Medicine Series, 1919, vol. 1, p. 181. Lambert British Medical Journal.

¹² Billings: Diagnosis and treatment of dysentery. Practical Medicine Series, 1919, vol. 1, p. 184.

eral varieties of the Flexner group. They are distinguished by cultural characteristics. All, however, have this in common; they all react immunologically (more or less) to a serum prepared from one of its members. This serum has little effect on the Shiga bacillus and vice versa.¹³ Both produce symptoms and lesions of dysentery, but it is noteworthy that the Shiga bacillus is rarely met with outside of epidemics, while the Flexner bacillus is widely distributed and is often found in terminal dysentery. Duval and Leiman¹⁴ state that in 100 such cases examined by them the Shiga bacillus was not encountered.

Bacillary dysentery is essentially a water-borne disease. However, food, fingers, and flies may play some part in its spread. Epidemics can be controlled by boiling or chemically sterilizing all drinking water. The writer was able to control an epidemic in camp at Santiago, Dominican Republic, in this manner. All drinking water in camp had been sterilized by the addition of chlorinated lime, 1 to 500,000, yet in spite of all precautions new cases of dysentery developed daily. It was decided to stop all liberty, as practically all drinking water at Santiago is taken from the Yacque River and delivered from house to house by boys on burros, where it was drunk by men on liberty. Bacillary dysentery is naturally endemic, as the natives do not take kindly to sanitation. The troops in question were natives in training under American officers, and as soon as they had learned the danger of drinking unboiled water the epidemic subsided.

The Shiga¹⁵ bacillus elaborates two distinct toxins, one soluble called exotoxin, a neurotoxin which attacks the central nervous system; and one closely fixed to the cell protoplasm, called endotoxin, which attacks the intestinal tract only. The horse is subject to immunization with both Shiga and Flexner group bacillus. It is usual to immunize horses separately to the two groups. The serum may be obtained and administered separately in the treatment of dysentery caused by Shiga or Flexner bacilli, as determined by bacteriological examination, or polyvalent serum may be obtained, which should contain antitoxin for all toxin in the two groups.

Vaccination: H. Vincent¹⁶ reports vaccination tests in 2,175 subjects. He states that the injection, though only containing 500,000,000 to 750,000,000 bacilli, rapidly checked an epidemic due to Shiga's

¹³ Simon Flexner: Serum treatment of bacillary dysentery. *J. A. M. A.*, 76:108, Jan. 8, 1921.

¹⁴ Duval and Lieman: Bacillary dysentery. *Forchheimer's Therapeutics of Internal Disease*, 1919, vol. 2: 18-306.

¹⁵ R. C. Robertson: The toxin of bacillus dysenteria. *Shiga*, *British M. J.*, London, p. 729, Oct. 21, 1922.

¹⁶ H. Vincent: Human vaccination against bacillary dysentery. *Compt. rend. Soc. de biol.*, 85: 965, Paris, Nov. 26, 1921.

bacillus. Of the 2,175 partially vaccinated subjects, 33 cases of dysentery occurred in the following four days, the percentage being higher in unvaccinated individuals. The morbidity rate in vaccination was 16 per 1,000; among unvaccinated individuals the morbidity rate was 228 per 1,000. He further states that in a recent epidemic due to Flexner bacillus a polyvalent vaccine was used. The morbidity rate in vaccination was 8.14 per 1,000; the mortality was zero. Morbidity and mortality rates among the unvaccinated were, respectively, 70.57 and 1.56 per 1,000. For vaccinated cases the duration was brief (two or three days) or moderate (seven to nine days).

The writer has made a careful review of recent literature and has been unable to find other reports of successful vaccination against bacillary dysentery in human beings. The consensus of opinion from experimental study is that if the toxicity of the bacilli is removed chemically the antigen is so changed as to be unsuitable for immunization purposes. However, S. Kana¹⁷ has produced partial immunity in rabbits, both by oral and subcutaneous administration of vaccine. The degree of immunity being determined by the intravenous inoculation of lethal doses of living bacilli dysenteriae (Shiga) whose virulence for the rabbit had been determined.

The incubation period is short, probably not more than 48 hours. The onset is usually sudden, slight fever, pain in abdomen, frequent mucous stool, blood usually appearing within 24 hours. Usually blood-streaked mucous (often pure blood) and marked tenesmus with urgent desire to go to stool is almost constant in numbers of cases. Stools may vary from 10 a day to 20 an hour. The temperature may reach 100° or 104° F., but usually ranges from 99° to 100° F. Marked toxic debility is present from the first. Blood agglutination tests for specific bacilli is greater and is a more reliable method of diagnosis than the isolation of the bacilli from stools and will save much delay.

Serum treatment: Recent literature contains numerous reports of serum treatment of bacillary dysentery with uniformly good results. Lornie and Jones,¹⁸ in a report of serum treatment in 10 cases of bacillary dysentery, state that during the second half of 1921 there were 728 persons in mental hospitals attacked with this disease, and of them 126 died. The serum used was prepared by injecting horses with cultures of Shiga's, Flexner's, and Cruse's bacilli. The cases of dysentery reported were severe infections with blood and mucous in the stools, 25 cubic centimeters, and in some instances 40 cubic centimeters, of the antidysenteric serum was injected. The out-

¹⁷ S. Kana: Dysentery immunization in rabbits by the oral and subcutaneous methods. *Brit. J. Exper. path.*, 2: 256, London, December, 1921.

¹⁸ P. Lornie and P. Ellis Jones: The treatment of asylum dysentery by means of anti-dysentery serum. *Brit. M. J.*, London, p. 946, June 17, 1922.

standing results were rapid clearing up of blood and mucus, cessation of diarrhea, rapid fall in temperature, immediate and marked physical improvement. Grant ¹⁹ gives the following summary of 96 cases of bacillary dysentery treated by Varlard and Dopter:

	Stools in 24 hours.	Number of cases.	Deaths.
1. Ordinary cases.....	15- 20	50	0
2. Severe cases.....	30- 80	18	0
3. Grave cases.....	80-150	24	0
4. Very grave cases.....	150-288	4	1

He states that the mortality following the administration of serum is from 33 to 50 per cent less than after other methods.

De Biehler ²⁰ in 1922 reports 129 cases treated and concludes "the serum treatment of dysentery is of first importance."

In the writer's series of 32 cases, 5 were given serum treatment. Four of these five were very grave, two being in extremis and at the time were barely being kept alive with intravenous saline and stimulants. In all cases there was a rapid clearing up of blood mucus and cessation of diarrhoea. In all except one there was marked physical improvement. There was one fatal case, in the author's opinion due to no fault of the antidysenteric serum but to the fact that the patient was too far gone at the time the serum was given to recuperate, though there was a cessation of the symptoms of the disease per se. The fifth case was a 2-year-old boy (all others having been native Dominican soldiers). He was very toxic the first day; the second day there were numerous bloody stools with marked tenesmus. That night he was given 10 cubic centimeters of polyvalent antidysenteric serum. By morning practically all symptoms had disappeared and did not recur. No further injections were given. In the later case the serum was given hypodermically, all other cases intravenously.

Such a small number of cases in themselves does not permit the drawing of far-reaching conclusion, but taken in consideration with the almost universal good results being reported by competent investigators, they would seem to indicate that in the antidysenteric serum we have a reliable specific in the treatment of bacillary dysentery. As in the case of antidiphtheric and other serums, the best results are to be obtained when it is given early in the course of the disease.

¹⁹ S. G. Grant: *Disease of the rectum, anus, and colon.* W. B. Saunders Co.

²⁰ Mathilde de Biehler: *Arch. Medicine de Med. de enf.* Paris, 25: 464, August, 1922.

NOTES AND COMMENTS.

In compliance with the statement in the fourth paragraph of the preface of the United States Naval Medical Bulletin, viz, "In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will recommend that a letter of commendation be forwarded to him and that a copy of this letter be attached to his official record," a board of medical officers appointed to designate those articles published in the BULLETIN that are deserving of commendatory notice have adjudged the following to be of particular merit and letters of commendation have been forwarded to the authors:

"The size of the normal heart, a teleroentgen study," by Commander H. W. Smith, Medical Corps, United States Navy, and Lieut. Commander W. A. Bloedorn, Medical Corps, United States Navy, which was published in the BULLETIN of February, 1922.

"Revaccination against smallpox and a discussion of immunity following cowpox vaccination," by Lieut. E. Peterson, Medical Corps, United States Navy, which was published in the BULLETIN of March, 1922.

"Glandular therapy and body growth," by Capt. D. N. Carpenter, Medical Corps, United States Navy, and Lieut. D. Ferguson, Medical Corps, United States Navy, which was published in the BULLETIN of April, 1923.

In a lecture delivered at the Institute of Pathology and Research, St. Mary's Hospital, London, on June 14, Prof. Georges Dreyer, of the Department of Pathology, University of Oxford, set forth some new principles in bacterial immunity, stated their experimental foundation, and discussed their application to the treatment of chronic infections and to tuberculosis in particular. An account of Professor Dreyer's researches appears in the June number of the British Journal of Experimental Pathology. Both the British Medical Journal and the Lancet comment editorially on the importance to the future progress of medicine of the facts disclosed by these researches.

When a vaccine is introduced into the body it is essential that the antigen should come into intimate contact with the body cells if antibodies are to be produced. Dreyer assumed that the absorption of bacterial antigens from acid-fast and gram-negative bacteria is hindered by the fatty envelope by which the bodies of these bacteria are surrounded, and the essential feature of his investigations lies in the separation of the more soluble constituents of the bodies of bacteria from the relatively insoluble fatty and lipoid substances which form the envelope.

In the greater part of his experiments Professor Dreyer dealt with the tubercle bacillus. Masses of tubercle bacilli obtained from a glycerin broth culture were treated with formalin and later with acetone and eventually a product was obtained which was entirely nonacid fast. This product was at first spoken of as "defatted" antigen. However, in a letter from Professor Dreyer, published in the *British Medical Journal* of July 7, 1923, he says that it is desirable that the term "defatted" should not come into general use, as only some of the lipoidal substances are taken away in the present mode of preparation.

"I propose to introduce a new word to describe the vaccines or antigens prepared by this or similar methods of extraction. The essential factors in the process are the fixation treatment by formalin and the successful acetone extraction which the fixation permits. The bacteria so treated become, as I have described, nonacid-fast and gram-negative and are changed in appearance. They have been thoroughly washed out, and I propose to call them 'diaplytes,' from the Greek word *πλυτος* (washed), in its intensive form *διαπλυτος* (washed through and through). I propose to speak of 'diaplyte vaccines' or 'diaplyte antigens,' and in the process of their preparation I should describe the acetone used as being the 'diaplytic agent.' I think there is justification for introducing a new word for the description of these vaccines, and it seems desirable to use one which has no previous connotations in pathology."

The method of preparing diaplyte antigen is described as follows:

Tubercle bacilli are grown on the surface of glycerin broth or other suitable liquid mediums for two or three weeks. The fluid is decanted off and the organisms are ground up in a mortar with a few drops of liquor formaldehydi. More formaldehyd is gradually added with constant grinding until from 150 to 200 cubic centimeters of the liquor formaldehydi have been added to each 5 grams of bacilli weighed wet. This suspension is heated in a flask to 100° C. for four hours, filtered, and the residue washed three or four times with acetone. The suspension is then filtered through calcium-free paper, and the residue extracted three or four times with acetone

and then in a Soxhlet apparatus. The insoluble residue is dried and ground in a sterile mortar. A weighed quantity is ground up with sterile saline solution to a paste, more saline being added during the grinding. It is then centrifuged. The supernatant fluid is pipetted off and, when diluted with saline, containing formaldehyd, constitutes the antigen suspension.

Dreyer found that rabbits injected with the defatted products of the tubercle bacilli developed antibodies which could be demonstrated by precipitation, complement fixation, and agglutination experiments, and that they produce a serum which reacts not only with the defatted antigen but also with a recognized antigen of the usual type prepared from tubercle bacilli. He further found that the defatted antigen reacted in vitro, not only with the serum of animals which had been injected with this defatted antigen but also with the serum of animals which had been injected with an ordinary emulsion of living tubercle bacilli. Thus it seems probable that these researches will lead to the elaboration of a trustworthy serum test for tuberculosis.

The important part of Dreyer's work concerns the treatment of tuberculous guinea pigs with defatted or diaplyte antigen. Four animals were infected with a strain of living tubercle bacilli which usually produced death in 4 to 10 months after inoculation. In one of these animals treatment was commenced 28 weeks after infection. The animal then weighed 630 grams, about 200 grams less than the average weight of a pig of its age. The spleen was large and easily palpable, and there were enlarged glands in the inguinal region. Ten injections of diaplyte antigen were given at intervals varying from 3 to 13 days, the whole treatment occupying 18 weeks. Two weeks after the cessation of treatment the animal appeared to be healthy, and was of normal weight for its age. As a result of treatment this tuberculous animal gained 300 grams in 20 weeks. In two other animals equally satisfactory results were obtained. The fourth animal improved under treatment, but died shortly after the birth of a litter of young. Microscopical examination of the lesions in this animal showed healing, with fibrosis.

Encouraged by these results Dreyer has caused the treatment to be tried on nearly a hundred advanced human cases with improvement which, in the opinion of the investigators, is of a type exceeding that obtainable by any other form of treatment.

"It is too soon," says the *British Medical Journal* of June 23, "to attempt to express any judgment on the results obtained on human cases of tuberculosis, but the experiments carried out on animals justify us in entertaining great hope of the efficacy of this method, and we shall look forward with the greatest possible interest to the

full report of the first batch of cases treated. * * * It is difficult to summarize the result of Professor Dreyer's experiments, and it is impossible to forecast the effect they may have on the further development of methods for the diagnosis and treatment of infective disease. But putting the matter at the lowest, he has made an important contribution to our knowledge of bacterial immunity, and has devised methods by which it may be obtained where hitherto it has been inobtainable."

In commenting on these researches, the *Lancet* of June 30 informs its readers that "the success of the Dreyer tubercle antigen, if it should prove as serviceable, in other hands, will be, like the Toronto work on insulin, the keystone of long and patient work in many lands."

In reference to Dreyer's work, the *Journal of the American Medical Association* of July 14, 1923, says:

"The waxy capsule of the tubercle bacillus has long excited the interest and curiosity of research workers. In their excellent compilation of the chemistry of tuberculosis, Wells, DeWitt, and Long trace these investigations through the literature of many countries. Last year Long and Campbell determined the proportion of total tubercle bacillus lipin present as wax, and immunologic experiments seem to indicate that the virulence of the organism bore some relation to the amounts of wax in the capsule. In fact, experiments have been made with vaccines made from the waxy portion of the organism.

"It is unnecessary, of course, to remind our readers that this work is in the experimental stage, at least so far as it concerns the treatment of tuberculosis. The experiments are scientific and have good theoretical basis; future developments will be observed with great interest."

The various reports of the medical department of the United Fruit Co. contain much interesting information concerning the medical and surgical care of the company's employees in the Tropics and sanitary matters affecting the company's interests.

The following comment on the destruction of ants is taken from the eleventh annual report, recently issued:

In tropical countries a great many species of ants are to be found, and some of them are very troublesome. Certain varieties prove very destructive to vegetation, and it is not unusual to find that a favorite garden plant or shrub has been completely deprived of its foliage over night.

Others, like the termites, prove very destructive to furniture and buildings constructed of wood, which they honeycomb and destroy.

Again some varieties invade the dwellings in search of food and prove a veritable nuisance in the ice boxes and in all accessible food supplies. At times they will enter the beds and bite the occupants, causing a great deal of irritation and annoyance. Though not known as being able to transmit disease, their presence calls for methods of extermination.

During the past year ants invaded some of our steamships in considerable numbers and could not be destroyed by fumigation with cyanide or sulphur gases. Their nests were concealed in hidden recesses of the ships, which could not be penetrated by these agents. Large numbers of the workers or food foragers could be destroyed, but unless the queen ants were reached in the nests the workers were rapidly replenished. We succeeded in ridding the steamships of ants by using the formula recommended by E. R. Barber, published in the *Farmers' Bulletin*, United States Department of Agriculture, March, 1920, which is as follows:

Granulated sugar-----	pounds--	9
Water-----	pints--	9
Tartaric acid (crystallized)-----	grams--	6
Benzoate of soda-----	grams--	8.4
Boll slowly for 30 minutes. Allow to cool.		
Dissolve sodiumarsenite (C. P.)-----	do--	15
In hot water-----	plnt--	1
Cool. Add poison solution to sirup and stir well.		
Add to poisoned sirup: Honey-----	pounds--	1½
Mix thoroughly.		

It was found that the sugar in the preparation recrystallized and glucose was substituted. This preparation has proved very effective on our ships and probably could be utilized advantageously in tropical dwellings.

The preparation is placed in small tin boxes, one side of which is indented to render it accessible to the ants. A poison label is placed on the box. The solution of arsenic is sufficiently weak not to destroy the ant until it reaches the nest. A returning foraging ant feeds 12 or 15 others, including the young ants and queens, and in a few days the colony is destroyed; or, if not completely destroyed, the remnant migrates. If the arsenical solution is too strong the worker is killed before it reaches the nest and its effectiveness is lost.

In the Tropics a nest on a plantation is readily destroyed by making a hole in it and pouring in 1 to 4 ounces of carbon disulphide, after which the opening is closed. The fumes rapidly penetrate the chambers of the nest and destroy the colony. In the case of wood ants, measures must be taken to prevent their access to the building. We have referred to these precautions in a previous report.

A preparation consisting of 3 parts by bulk of sodium flouride, 1 part by bulk of pyrethrum powder, 1 part by bulk of cornstarch has been found very efficacious for the destruction of insects appearing aboard our steamers.

Commenting on the increasing virulence of smallpox, the Boston Medical and Surgical Journal of July 19, 1923, says:

"Although the opponents of vaccination laws contend that smallpox is growing less frequent and less virulent as a result of better sanitation, the facts seem to indicate that this reasoning is unsound, for the Statistical Bulletin of the Metropolitan Life Insurance Co. calls attention to the fact that the reports of health officers of 275 cities in the United States and Canada show that the case fatality rate for smallpox during 1922 was five times the rate for 1921. In the United States there were 298 deaths in 1921 and 475 in 1922, the rate for 1921 being 1.1 per 100 cases and 5.7 per 100 cases in 1922.

"Although the actual number of cases of smallpox in the reporting cities dropped from 26,977 in 1921 to 8,709 in 1922, the actual number of deaths increased from 301 to 478.

"It is recognized that nearly all diseases have varying types of virulence during different epidemics.

"The material aspects of a smallpox epidemic should have weight as well as the suffering and death of individuals, for when a case of smallpox appears in a community a heavy financial burden is imposed."

The International Medical Digest of July, 1923, presents the following abstract of a paper by H. W. Hill, M. D., on "The clinical diagnosis of smallpox and chicken pox," which appeared in the Canadian Medical Association Journal of March, 1923:

"The severity of smallpox is increasing. Furthermore, the mildness of the type prevailing for the past few years had led to relaxation of the vaccination rules. Patients have preferred the risk of mild smallpox to vaccination by the old method. However, as the severe type is now becoming more prevalent, and the new method of vaccination is less distressing, it should be applied more frequently. An exact diagnosis is essential.

"The mild type runs the same course and displays the same symptoms as the severe type, except that the lesions are fewer and the manifestations milder. The mildness of the symptoms must not lead to confusion with chicken pox, which is analogous but wholly distinct as a disease process. Neither condition produces immunity against the other, and neither predisposes to the other. The clinical manifestations may be similar. A careful study of the case history

should include a history of association with patients suffering from manifest disease of either type, previous attacks of either disease, or vaccination, the date on which the first symptoms appeared, the character of the prodromal symptoms, the date of the appearance of the cutaneous symptoms, the location of the first lesions and their distribution, and the development of the lesions from day to day.

"In smallpox the systemic disturbances appear during the prodromal period and usually undergo improvement after the appearance of the eruption. The extent of the eruption on the face is a fair index to the general severity of the attack. In chicken pox prodromal symptoms are practically lacking and the systemic disturbances, if they appear at all, begin with the eruption and continue for a few days. In smallpox itching is not usual during the early stages of the eruption, and scratching does not injure the lesions; burning is usually felt at the site of the coming macule before the latter appears. Itching is characteristic of chicken pox; scratching or any other contact easily ruptures the thin-walled lesions. This is an important diagnostic criterion. In smallpox the lesion rarely ruptures but shrinks into the skin, leaving a hard, brown, tenacious scab. In chicken pox the vesicle shrinks by evaporation and forms a brittle cap, which is readily dislodged. In mild or abortive smallpox and in varioloid similar caps may be found on the body, as distinguished from the palms and soles where the lesions are typical.

"In smallpox the lesions are round, uniform in size, not crenated at the borders, and appear chiefly on the face and arms. In chicken pox the lesions are round or oval, vary in size, are usually crenated, broken or disfigured, and appear chiefly on the face and body. The ease of rupture is also a diagnostic criterion. The fact that numerous unruptured vesicles are observable is, in itself, presumptive evidence of smallpox. The smallpox areola is generally narrow and circular; that of chicken pox wider and more irregular in contour; the depth of color diminishes more gradually toward a more diffuse edge, or radiates into red offshoots, giving the impression of a red, ragged star.

"Chicken pox, although most common before adolescence, may occur during adult life. Smallpox almost always invades the palms and soles; however, as chicken pox may involve the palms or soles also, this is not a conclusive differentiating factor. Both diseases may involve the scalp, mouth, and pharynx. The smallpox vesicle is frequently umbilicated, while the chicken-pox vesicle is not; however, a pseud umbilication is noted during the late pustular stage. These two phenomena must not be confused.

"Severe smallpox may be recognized by (1) an incubation period of from 12 to 14 days; (2) absence of a history of previous attacks

and lack of round pits on the skin; (3) absence of a history of successful vaccination within from five to seven years; (4) prodromal symptoms of about three days' duration, consisting in headache, intense backache, fever, epigastric pains, and chills of sudden, severe onset; (5) the appearance of the eruption on the third or fourth day, beginning on the face and wrists, appearing most profusely on the limbs rather than on the body, and attacking the palms and soles almost without exception; (6) development of the eruption in one crop, the lesions appearing steadily for from 24 to 48 hours; and (7) uniform development of the round lesions. The stages consist in (a) flea-bite macules, lasting for 24 hours; (b) shotty papules, appearing on the second day; (c) umbilicated vesicles, appearing from the third to the fifth day; (d) firm, opaque pustules, lasting from four to six days and accompanied by secondary fever in severe cases; (e) firm crusts, appearing about the thirteenth day of the eruption; (f) dense scabs, and deep-seated, tenacious mahogany plaques, lasting for variable periods; (g) pitting, which may be deep and permanent; these are red for months, and then become white. Mild smallpox leaves few and small pits.

"During the prodromal period, diffuse erythematous patches may appear. These may be distinguished from those of scarlet fever by the fact that the latter do not attack the face, and are composed of red dots, while the erythematous rashes are continuously red. The rash may be differentiated from that of measles by its time of appearance and by the absence of the coryza, bronchitis, and photophobia characteristic of measles.

"Chicken pox may be assumed if the period of incubation is about 18 days; there is no history of previous attacks of this disease, but vaccination against smallpox has been successful; no prodromal symptoms are present; the first signs of eruption coincide with the systemic disturbances; the eruption begins on the back, chest, or face, is most profuse on the body and rare on the hands and feet; the eruption appears in successive crops, on successive days; the lesions are round, and take the successive forms of macules, papules, clear vesicles, pustules; if any of the vesicles remain; and crusts. The pits are few and superficial.

"The new method of vaccination consists in a series of linear scratches or superficial incisions; this is superior to the scarification method, but the open wound is liable to infection. The Canadian method is as follows: The skin is disinfected by soap and water, alcohol, and ether. The content of one capillary tube is deposited in three spots, and six or eight punctures are made through the drops with a sterilized needle held almost parallel to the surface of the skin. The surplus vaccine is wiped off. No after treatment or dress-

ing is necessary. The appearance of an anaphylactic reaction at the sites of puncture indicates that the subject is immune to vaccination and will not contract smallpox. In the case of nonimmune individuals, macules appear at the puncture sites in about a week; these rapidly become papules, vesicles, and pustules, surrounded by areolæ, and accompanied by tenderness of the axillary glands, some fever, and other mild reactions, lasting for one or two days. The pustules dry and contract; the scabs fall off, leaving flat pits."

The Nation's Health of July 15, 1923, contains the following comment on smallpox control on shipboard:

"On February 14, 1921, the United States battle fleet, with a personnel of approximately 25,000 men, arrived at Balboa, Canal Zone. On one of the battleships there were 14 cases of mild smallpox, and subsequently 11 additional cases occurred on the ship and 3 among the contacts at the quarantine station. The total number of cases in the outbreak was 28. There were no deaths. There were no secondary cases on the infected ship and no cases on any of the other ships of the fleet. The measures put in force for the control of the outbreak were so simple, cheap, and effective that they are considered worthy of record.

"The infected vessel was placed in quarantine, but the restrictions thereby imposed were ameliorated in every way which was compatible with safety, e. g., the small boats of the vessel were permitted to participate in the fleet sailing and rowing contests and the men were allowed to go on fishing and swimming parties, the sole requirement being that they be accompanied by an officer who saw to it that no contact was had with the personnel from other vessels and that at all times the quarantine flag was flown by the small boats used by the men from the infected ship.

"The entire personnel of the fleet was immediately revaccinated and the company of the infected vessel was vaccinated and revaccinated until a successful 'take' or a reaction of immunity was obtained on every man. All personnel was inspected by medical officers twice daily and any person remotely suspected of having smallpox or a temperature above normal was sent to the quarantine station. All actual patients were isolated in the wards of Ancon Hospital.

"The vessel was not fumigated, and no chemical disinfectants were used. All belongings of infected men, suspicious cases, and close contacts were sent ashore and sterilized with steam. All hammocks, bedding, and wearing apparel of the remainder of the personnel were thoroughly scrubbed with soap and water, dried in the sun, and afterwards sunned daily. The interior of the ship was thoroughly

scrubbed with soap and water and repainted. Scuttle butts were flamed with a gasoline torch every hour. All mess gear was sterilized thrice daily by boiling five minutes after thorough cleansing in a boiling solution of soap and water. Men were required to wash their hands carefully in fresh water before each meal and were encouraged to bathe or swim at least once daily.

The vessel sailed in close quarantine, completing its 14-day quarantine period at sea. Before sailing all sick were put ashore at the quarantine station in order that the vessel should have a free sick bay should subsequent cases develop en voyage. Just prior to sailing the temperature of all officers and men were taken and the entire ship's company subjected to careful inspection, all suspicious cases being sent to the quarantine station. No cases developed en voyage or subsequently.

"Aside from the fact that the officers and men were deprived of shore liberty and could not visit other vessels or receive any person on board, the routine of the infected ship continued as though there was no epidemic. Supplies and mail were delivered at the gangway, and moving-picture exhibitions were given each evening. The vessel was not detained, but allowed to continue without interruption its maneuvers with the fleet. Except for the hospital charges and the cost of rations for men detained at the quarantine station, the vessel was put to no expense which it would not ordinarily have had. In any event the paint would sooner or later have been needed, and there was no destruction of property by fumigants of very dubious efficiency. Throughout the entire quarantine period the ship's company was apparently contented and happy; certainly it was very good natured and patient. It is believed that the 'sweet reasonableness' of the control measures may have contributed not a little to this end."

In the Public Health Reports of July 6, 1923, the following suggestions and recommendations embodied in a report recently made by Mr. Stephen Olop, superintendent of construction and recorder of the board of fumigation and ventilation, United States Public Health Service, are printed:

"In connection with the problems in ventilation related to freeing vessels from poison gas after fumigation, the writer recommends: (a) That special attention be given to the adjustment of ventilator cowls, and (b) that the bilge pumps be operated as soon as the ship's crew may be allowed access to same with safety. The reasons are stated as follows:

"Upon further study of observations made by him in the experiments conducted on the *Hartford*, set forth in his report of December

6, 1922, and from miscellaneous inquiries, experiments, and observations made by him since that time, the writer concludes that special attention should be accorded the adjustment of ventilator cowls aboard ship. Observations made on the *Hartford* indicate that, generally, elimination of gas proceeds most slowly in the windward portion of the average hold. This appears to be the case not only where the hatch opening is the sole means for ventilation, but also where it is augmented by ventilators. The air will travel downward mainly at the leeward side, thence in counter-windward direction, thence upward and finally out. If the cowls of windward ventilators are set to face the wind, much air will enter through them, which is met by air currents within the hold moving in counter-windward direction, causing a conflict of currents and thus reducing their ventilating values considerably. Pockets occur mainly in windward portions of the average holds.

"The writer observed that on vessels carrying highly perishable cargo, such as fruit, particular attention is given to careful adjustment of the ventilator cowls, and that those at the windward side of a hold are turned away from the wind and those at the leeward side to face the wind, thus inducing a downward flow of air in the leeward and an upward flow in the windward portion of a hold. That such arrangement of the ventilator cowls is the most efficient appears fully plausible from the observations made on the *Hartford* and the practice on well-managed ships. It was further observed that, as stated in the writer's report mentioned above, efficiency of ventilators as inlets and outlets, respectively, diminishes materially and rapidly as the horizontal axis of the cowl departs from the direction of the wind, or, in other words, as the angle formed by the horizontal axis of the ventilator cowl and the direction of the wind is increased.

"In view of the foregoing, the writer recommends that special attention be given to the facing of ventilator cowls, and that: (a) Ventilators at windward side of a hold be faced *away* from the wind, and ventilators at leeward side of a hold be faced *toward* the wind; (b) the horizontal axis of cowls of such ventilators be made coincident, as nearly as possible, with the direction of the wind, and that adjustment of cowls be corrected accordingly as changes in direction of wind or position of ship occur during ventilation after fumigation.

"The considerations prompting the foregoing apply also largely to spaces other than holds, such as lockers, storerooms, etc., where the phenomena involved occur, but are less distinguishable because of greater irregularity of shape as compared with cargo holds.

"It has been noted that shut-in spaces, with little or even almost no provision for ventilation, exist on most ships. Often such spaces

are difficult of access. It has occurred that from known and, at times, unknown causes gas remained or accumulated in certain spaces below. It may be that the gas was not properly eliminated because of lack of ventilating facilities, or that it condensed in contact with cool objects and diffused after the time when the hold was believed to be clear; and there may have been instances when the gas was absorbed by the cargo or by the bilge water and subsequently liberated.

"The writer finds that on some ships plying in tropical waters, where noxious odors and gases quite readily form from decomposition of highly perishable cargo (such as bananas, mangoes, etc.), the bilge pumps are called into action to relieve the situation. This is done not only to remove bilge water (which would, under the conditions referred to, be especially foul) but also to induce air currents in spaces insufficiently or not at all reached by the regular ventilating apparatus. Thus it was found that operation of the bilge pumps is of value even after the bilges are dry. The writer learned from one ship's captain that he usually operates the bilge pumps for some time after the ship has been fumigated and cleared at quarantine, finding that he has then less trouble from gas that is still noticeable below or that makes its appearance later. The writer observed on a recent steamship trip that operation of the bilge pumps dry (sucking air) will set up air currents and induce ventilation in most of the places that are especially difficult to free from gas.

"In view of the somewhat obscure properties of concentration and condensation of some gases, and the certainty that it is desirable to empty the bilges (*a*) for sanitary reasons in general, (*b*) because of possible gas condensation and absorption by the bilge water, and (*c*) to improve ventilation of remote spaces, which latter point in itself is of commanding importance, the writer recommends that consideration be given to the issuance of new instructions ordering the operation of the bilge pumps until the bilges are fully drained, and continued thereafter for a period of not less than 20 minutes, and preferably longer, such operation to be commenced as soon after fumigation as the ship's crew may safely be allowed access to the pumps."

We have become quite accustomed to the use of the airplane for the transportation of the wounded, but the medical value of tanks has not yet been recognized. In a paper entitled "Mars Hygeaque," appearing in the Journal of the Royal Army Medical Corps of July, 1923, Maj. M. B. H. Ritchie, R. A. M. C., advances the idea that "ambulance tanks, vulnerable only from direct hits and capable of entering gas zones with impunity, may become the mobile advanced

dressings stations of the future. It is possible that tanks will eventually succumb to aircraft as the latter become more heavily armed and precise in marksmanship. Perhaps the tank, distinctively marked, may eventually be used by medical units only. Built as an engine of destruction, it may atone for its youthful frightfulness by devoting its old age to succoring the wounded."

In the British Medical Journal of June 23, 1923, Dr. J. G. Reed, divisional medical officer, Sarawak civil service, Borneo, reports his observations on the treatment of helminthiasis by a mixture of oil of chenopodium and carbontetrachloride. It was found that the combination has a much higher efficiency in the removal of ascaris and hookworms than either drug used alone.

The following standard treatment was evolved for adults: 1 ounce of castor oil is given at night, and the next morning a mixture consisting of 4 cubic centimeters of carbontetrachloride, 1 cubic centimeter of oil of chenopodium, and 15 cubic centimeters of liquid petrolatum is administered.

The mixture appears to have no effect on *Trichuris trichiura* and *Strongyloides stercoralis*.

We learn from the Lancet of June 30, 1923, that the annual meeting of the Royal Society of Tropical Medicine and Hygiene was held in London during the early summer. Admiral Sir Percy Bassett-Smith, whose name is familiar to medical officers of the United States Navy, was installed as president by the retiring president, Sir James Cantlie. "The latter marked the close of his two years of office by presenting a handsome chain and enameled badge to be worn by all future presidents of the society in commemoration of his long association with the society. The medallion bears the emblem of the society, and anopheles mosquito, with a cinchona leaf, and is suspended from a gold chain comprising links bearing the names of past presidents of the society.

"The new president then made the first award of the Manson medal, founded in memory of the late Sir Patrick Manson, to Surg. Gen. Sir David Bruce, and in doing so referred to the latter's past presidency of the society and well-known achievements in the cause of humanity by his conquest of Malta fever and work on trypanosomiasis and tetanus. The first award was also made of the Chalmers memorial medal to M. Emile Roubaud, of the Pasteur Institute of Paris, in recognition of his able researches in the domain of tropical medicine and his distinction in helminthology and entomology.

This medal was founded by Mrs. Chalmers for an original worker in tropical medicine or hygiene, of any nationality, and under 45 years of age."

Failing to obtain satisfactory results in the treatment of Vincent's angina by daily swabbing of the affected parts with 3½ per cent iodine or with salvarsan and glycerin, physicians attached to the Kingston Avenue Hospital, according to the Weekly Bulletin of the Department of Health, city of New York, devised the following treatment, which is reported to be very efficacious: Each and every crypt in the affected tonsils is entered and cleaned with a half-strength tincture of iodine applied on cotton wrapped about the end of a fine metal applicator. The tonsils are then everted and the surface behind the pillars is cleaned with iodine. Gland ducts on the posterior pharyngeal wall are also cleaned by introducing the fine iodine swab. Along with this cleansing process hot saline irrigations are given every two hours.

In a paper on "Local anesthesia," which appeared in the UNITED STATES NAVAL MEDICAL BULLETIN of June, 1923, Lieut. O. D. King, Medical Corps, United States Navy, says: "Since the introduction of the use of novocain and adrenalin the field of local anesthesia has been greatly expanded and a stage of development has been reached by a perfected technic, which allows a large amount of major surgery to be successfully performed with the aid of these agents. Their usefulness and advantage are generally recognized in civil practice; and without claiming that the method of local anesthesia displaces general anesthesia, it certainly must be admitted that it is a permanent and valuable asset to surgery. For the naval surgeon to fail to recognize this fact and to remain content to use local anesthesia for minor operations only means that he fails to utilize the chief advantages offered by the method. With a moderate amount of training and endeavor on his part he can develop a technic which will enable him to perform a large percentage of his operations satisfactorily with local anesthetics."

Much surgery of the upper abdomen is to-day satisfactorily performed under local anesthesia, and a conscientious trial of this method by one who has prepared himself with some care to use it can not fail to bring to him the realization that there is a decided advantage in the method. Its use involves an intimate consideration of the patient as a whole and special surgical technic not necessary when general anesthesia is employed.

The naval surgeon who is interested in the subject of local anesthesia is referred to a recent publication, "Practical Local Anesthesia and Its Surgical Technic," by Robert Emmett Farr, M. D., F. A. C. S., which is commented upon in the section devoted to "Book Notices" in this number of the *BULLETIN*.

We learn from the *Nation's Health* of July 15, 1923, that in a recent communication (*American Journal of Physiology*, vol. 63, p. 185, 1923) Lee and Van Buskirk review a long series of proposed physical tests for diurnal fatigue and find that none of the cardiovascular constants studied, nor the Ryan skin reaction, nor the Flack and other respiratory tests, nor the resistance strength test of Martin is sufficiently delicate to detect the physical fatigue resulting from a 14-mile walk. Their study indicates some very interesting though slight differences between the average cardiovascular states of fatigue and unfatigued groups, but reveal no constant significant differences between the fatigued and unfatigued in the individual case.

No sooner are old tests for fatigue discarded than new ones make their appearance, and a particularly interesting and suggestive contribution to this subject has just come to us from Belgium. It depends on what is known as the "illusion of equal weight"—the tendency of the normal individual to assume that of two objects really equal in weight the smaller one is heavier. In the use of the test, which is based on this fact, a small ball of constant weight is taken and the subject is given a series of large balls of varying weight to select the one which seems equal to the small one. Both hands are used, the balls being passed from one to the other freely. The conclusions drawn, illusory though they may be, represent a rather complicated neuromuscular response; and, when the illusion decreases, the greater accuracy in estimating the weight of the balls indicates a less perfect functioning of the bodily reactions, even though it does lead to more correct results. Doctor Ley finds that the illusion of weight is quite definitely decreased by the ingestion of 25 grams of alcohol in the form of cognac, and that it is also quite definitely decreased by fatigue, results in regard to the latter point having been obtained by comparing reactions of nurses on night duty with the same nurses under ordinary conditions. Whether this test for fatigue and for the effect of alcohol will succumb to further criticisms, as have so many other similar tests, remains to be seen.

DIGEST OF DECISIONS.

The opinion of The Judge Advocate General of the Navy, as expressed in the following letter in connection with the amenability of retired officers on inactive duty to medical and hospital care in case of insanity, is published for the information of all medical officers:

JUNE 30, 1923.

9438-139-CMA.

From: The Judge Advocate General.

To: The Chief of the Bureau of Medicine and Surgery.

Subject: Retired officers on inactive duty, re amenability to medical and hospital care in case of insanity.

Reference: Your letter June 1, 1923, WSG:ESK, 126963(54).

1. In reference you state that your bureau is in receipt of a letter from the medical officer of the ——— naval district requesting information as to what action may be taken in the case of a retired officer on inactive duty who is manifesting signs of mental derangement, and that said medical officer states in his letter that "this officer is comparatively young and is causing some comment on account of his eccentricity, and I have not made any examination, as I am doubtful of my position and authority. From a superficial association I believe him to be a subject where restraint for the purpose of observation may be of benefit."

2. In this connection you request information as to whether officers on the retired list of the Navy, not on active duty, who appear to be suffering from mental derangement, may be transferred to a naval hospital for observation and treatment, except upon their own application.

3. This office is of the opinion that a retired officer not on active duty, who is deemed to be suffering from mental derangement, should not be ordered to proceed to a naval hospital for observation and treatment unless his transfer thereto is requested by the legal guardian of the officer himself or is directed by the Secretary of the Navy. Further, I am of the opinion that such action on the part of the Secretary of the Navy should be based on the facts and

circumstances of each particular case as they may arise, in general, warranted only where the officer is given to acts of extreme violence, has been declared mentally deranged by the proper local civil authorities, or where his conduct is such as to bring opprobrium on the naval service.

4. Where it appears to an individual in the naval service that an officer on the retired list of the Navy not on active duty is apparently suffering from mental derangement he should make a confidential report of the matter to the commandant of the naval district in which said officer is domiciled or sojourning for investigation. Should the commandant deem the investigation to have developed facts warranting further action, he should make appropriate report and recommendation to the Secretary of the Navy.

(Signed) J. L. LATIMER.

Approved 30 June, 1923.

(Signed) T. ROOSEVELT,
Acting Secretary of the Navy.

BOOK NOTICES.

Publishers submitting books for review are requested to address them as follows:

The Editor,
U. S. Naval Medical Bulletin,
Bureau of Medicine and Surgery, Navy Department,
Washington, D. C.

For review.

Books received for review will be returned in the absence of directions to the contrary.

PRACTICAL LOCAL ANESTHESIA AND ITS SURGICAL TECHNIC, by *Robert Emmett Farr, M. D., F. A. C. S.* Lea and Febiger, Philadelphia, 1923.

The dangers of general anesthesia are many. The causation or augmentation of an acidosis, the pulmonary irritation contributing to postoperative pneumonia, death during an operation, unnecessary traumatization of the tissue of the unconscious patient, vomiting, with consequent postoperative strain, emphasize the necessity for a better method of anesthesia.

General anesthesia has filled a great need in the advancement of surgery, but the time seems near when it will be more or less supplanted by local anesthesia even in operations of magnitude.

The important discoveries which have done most toward developing our modern successful methods of inducing anesthesia locally are the following: In 1853 Alexander Wood, of Edinburgh, discovered that hypodermic injections could be given by means of a hypodermic needle. Cocaine as an anesthetic administered by means of this needle was introduced by Carl Koller in 1884. Shortly after the introduction of this drug operations such as amputations, tracheotomies, and herniotomies were successfully performed without pain to the patient. The toxicity of cocaine was nevertheless a drawback and accounted for many unhappy results. A great improvement was made by Einhorn, who introduced novocain (procain) in 1905. This drug, which is used most extensively to-day, is much less toxic than cocaine, and besides possesses other qualities which make it almost ideal in this work.

Locally novocain exerts a prompt and pronounced anesthetic action, which is greatly intensified by the addition of adrenalin. Although it is unnecessary to use stronger than a 1 or 2 per cent solution, a 10 per cent solution may be injected into the tissues without causing any irritation. Novocain is but mildly toxic. It is perhaps because of its low toxicity more than to its many other favorable qualities that this drug has become the most widely used of all the local anesthetics. According to Braum 1.25 grams of novocain can be injected without fear of intoxication. For infiltration novocain solutions may be used in a strength of from 0.25 to 1 per cent. This, when combined with a small amount of adrenalin (2 to 5 drops of 1 to 1,000 solution of adrenalin to each 30 cubic centimeters of novocain solution), gives a most satisfactory anesthesia. In contrast to the many general and local toxic manifestations of the general anesthetics is the almost total absence of perceptible changes in the body following the use of novocain. Like ether, chloroform, or any other drug used in anesthesia, novocain is capable of producing severe, or even fatal, acute poisoning in man, but moderately large doses, when absorbed either intravenously or subcutaneously, show almost no noticeable change either upon the circulation or respiration.

The results obtained from the use of novocain depend very largely upon the skill and training of those who attempt to use it—skill and training which embody not only a knowledge of the principles and practice of inducing anesthesia but also a knowledge of, as well as the ability to apply, the special surgical technic which must be employed in order to operate successfully under this form of anesthesia. Those who have concentrated upon the use of local anesthesia and have developed a fair degree of skill in the method of its administration and in the proper methods of operating under its use, have presented sufficient evidence to make clear the fact that a fairly large percentage of surgical operations may be efficiently performed by the use of this method. As the efficiency of the method depends upon the surgeon's training and skill in its use, it would seem fully as incumbent upon all surgeons to prepare themselves for the efficient administration of local anesthesia in all cases in which its use is of advantage to the patient. With this point in view the author has prepared this volume, which is an expression of his views on the subject of local anesthesia as developed by his observation and by his own experience during over 20 years of active surgical practice.

The author's discussion falls logically into three parts. In the first of these he considers certain problems in connection with local anesthesia, including the special equipment required, the general technic necessary, and the anatomy of the sensory nervous system, a knowledge of which is essential to success. In the second part, the

subject has been considered regionally, all portions of the body, aside from the abdomen, being treated in detail. In the third portion of the book the surgery of the abdomen is considered.

In the chapter on equipment will be found descriptions of several ingenious devices developed by the author to further the successful employment of local anesthesia. Prominent among these devices is the pneumatic injector. This apparatus, says the author, more than any other element, has, by reducing to a minimum the labor, inconvenience, time, and margin of error made the use of local anesthesia a delight in his clinic.

The actual method of operating has a most important bearing upon the success which will attend any surgical procedure under local anesthesia. Hence points in surgical technic have been described by the author with more than ordinary detail.

Care in dissection, sponging, the tying of ligatures, retraction of the wound, and operating-room deportment are emphasized. The necessity for teamwork among assistants in the treatment of patients and the importance of the psychic factor have been fully considered.

Among the noteworthy features of the book are the numerous case reports which the author has appended to his description of the various operations which may be satisfactorily performed under local anesthesia and the excellent illustrations which help to make clear the various points brought out in the text.

The usefulness of local anesthesia is becoming more apparent daily in large clinics, and the variety of major operations which may be undertaken with this method is surprising to one who has continued to work with the assistance of general anesthesia. Anyone interested in local anesthesia will find a complete exposition of our knowledge of the subject as it stands to-day in this book.

CEREBROSPINAL FLUID IN HEALTH AND IN DISEASE, by *Abraham Levinson, B. S., M. D., associate in pediatrics, Northwestern University Medical School; attending physician, department of contagious diseases, Cook County Hospital, Chicago.* Second edition. C. V. Mosby Co., St. Louis, Mo., 1923.

Through recent investigations of the cerebrospinal fluid a great deal of information has been gained regarding the diagnosis and nature of many diseases. The cerebrospinal fluid is of great physiologic importance; and, as the author informs us, from the standpoint of pathology cerebrospinal fluid presents an exceptional opportunity for study. That the author has taken advantage of this opportunity is indicated by a few words of Ludvig Hektoen, who says in the foreword: "On reading the manuscript I soon became aware that the author had come to his task with not only a large experience behind him in the examination by various methods of the cerebrospinal fluid

as an aid in diagnosis but with a highly creditable record in the scientific study of this fluid as well."

In this book the author shows the varied character of the cerebrospinal fluid in health and disease. He begins his discussion with an interesting review of the history of the investigation of the cerebrospinal fluid. Bacteriology, serology, and chemistry have all played an important part in shaping the history of this research. As for bacteriology, we have only to remember that the discovery of the tubercle bacillus by Robert Koch changed the name of acute hydrocephalus to tuberculous meningitis and the conception as to its nature accordingly.

The discovery of the pneumococcus by Sternberg in 1881, the meningococcus by Weichselbaum in 1887, the influenza bacillus by Pfeiffer in 1892, and the demonstration of the trypanosome in cerebrospinal fluid by Castellani in 1903 helped to establish the cause of many inflammatory processes of the meninges.

Serology has added a great deal to the diagnostic and therapeutic uses of the cerebrospinal fluid. Bordet's discovery of complement fixation, Ehrlich's work on immunology, and Wassermann's serologic test all found practical application in the cerebrospinal fluid. Probably the most beneficial contribution in the field of serology was the discovery of antimeningococcus serum by Jochmann in Germany and by Flexner in America and the introduction of the intraspinal injection of the serum by Flexner.

Chemistry has taught us the composition of this fluid and cytology has advanced the study of it to a great degree. Likewise physical chemistry is making its impress on the history of cerebrospinal fluid. The H-ion concentration, cataphoresis, the Lange colloidal gold test, the ninhydrin reaction, and the precipitation tests, all of which are based on physicochemical principles, have thrown light on diseases of the central nervous system in general and on the composition of body fluids in particular.

A chapter is devoted to the anatomy and physiology of the cerebrospinal fluid, and it is followed by a detailed description of the various practical methods of obtaining cerebrospinal fluid from the living body.

The physical and chemical and the physicochemical properties of normal and pathologic cerebrospinal fluids are comprehensively presented to the reader.

Cerebrospinal fluid reacts to all processes that affect the central nervous system. It also reacts to systemic processes which increase the permeability of the meninges to certain chemical metabolic processes. Having reviewed the changes which take place in these conditions, the author outlines those methods employed in the exami-

nation of cerebrospinal fluid for the purpose of detecting the presence of pathologic processes which have been proved to be both simple and practical for clinical purposes and discusses their relative value.

A chapter is devoted to the cerebrospinal fluid changes which occur in various diseases, to which is appended a useful table indicating the cerebrospinal fluid findings in various conditions.

The book ends with a consideration of intraspinal treatment and a summary of the outstanding points considered in the volume.

In conclusion the author invites the reader's attention to the following lines of research, which he believes are of fundamental value in clearing up some of the contested problems in medicine.

1. The origin and function of the cerebrospinal fluid.
2. The chemical and physicochemical changes taking place in the fluid in various diseases and the principles underlying these changes, especially the principle of the Lange gold chloride test.
3. The chemical and physicochemical relation between the cerebrospinal fluid and other body fluids, especially blood.
4. The crystallization of the cerebrospinal fluid.

The solution of these problems, says the author, will open limitless opportunities for research not only in the field of cerebrospinal fluid but also in that of every other body fluid.

A TEXT-BOOK OF THERAPEUTICS, INCLUDING THE ESSENTIALS OF PHARMACOLOGY AND MATERIA MEDICA, by A. A. Stevens, A. M., M. D., *professor of applied therapeutics in the University of Pennsylvania; visiting physician to the University and the Philadelphia General Hospitals*. Sixth edition. W. B. Saunders Co., Philadelphia, Pa., 1923.

The original object of this book, as conceived by the author over 30 years ago, was to present a concise description of the most important pharmacologic reactions and to show their practical use in influencing the various disturbances that occur in disease. In making the various changes in each of the six editions through which the work has passed the author has adhered to this object, with the result that two generations of medical men have found it useful not only in their student days but later in practice.

The last revision occurred in 1909. The advances made in pharmacology and applied therapeutics since that time have necessitated many changes in the text. One notes that the articles dealing with the most important remedies have been rewritten, that many new drugs have been considered, and that the section devoted to applied therapeutics has been made to conform with modern practice. The subject is presented as in previous editions. In the first pages the author takes up the question of the composition and preparations of drugs, incompatibility in prescriptions, methods of administering drugs, and the conditions modifying the effect of drugs. Passing on

to a consideration of those drugs found useful in practice and certain remedial measures other than drugs, such as electricity, massage, applications of cold and heat, etc., he concludes the volume with a discussion of applied therapeutics.

The volume is well gotten up and makes a suitable companion piece for the author's "Practice of Medicine," which appeared last year.

EPIDEMIOLOGY AND PUBLIC HEALTH, A TEXT AND REFERENCE BOOK FOR PHYSICIANS, MEDICAL STUDENTS, AND HEALTH WORKERS, in three volumes, by *Victor C. Vaughan, M. D., LL. D., emeritus professor of hygiene in the University of Michigan*. Volume II, in which are considered *nutritional disorders, alimentary infections, and percutaneous infections*. C. V. Mosby Co., St. Louis, 1923.

The author of these volumes, who needs no introduction to the medical officers of the United States Navy, has called to his assistance in their preparation the experience of over 40 years in epidemiology and public health work. The first volume, which dealt with the respiratory infections, appeared last year and the third volume, in which the author will consider the venereal diseases and public health administration, we trust shall soon come from the publishers.

The present volume, which deals with nutritional disorders, alimentary infections, and infections introduced through the skin, possesses all the charm and interest which characterized the author's discussion of the respiratory diseases. In it, after discussing certain accessory food factors, he takes up in turn scurvy, beriberi, pellagra, rachitis, endemic goitre and cretinism, food poisoning, botulism, cholera infantum, the typhoid fevers, Asiatic cholera, the dysenteries and diarrhœas, sprue, Malta fever, the trematode, cestode, and nematode infestations, hookworm disease, filariasis, malaria, yellow fever, dengue, the trypanosomiasis, frambœsia, the kala-azars, tetanus, verruga peruviana, Rocky Mountain spotted fever, Japanese river fever, tularemia, plague, typhus fever, relapsing fevers, trench fever, epidemic jaundice, phlebotomus fever, anthrax, rabies, rat-bite fever, and snake bite.

Great stress is laid upon the importance of symptomatology and pathology in his discussions in connection with epidemiology and, following the plan of the first volume, the author has dwelt upon the history of each disease, which is not only interesting but important to a proper understanding of the subject. We regret that he had neither time nor space to go more deeply into these histories, for, as he once said, "No one can claim to be learned in any specialty until he is fairly familiar with what has been done previously along the same line."

A noteworthy feature of each discussion is a survey of what is being done throughout the world at the present time to eradicate the disease in question. The eradication of the communicable diseases

and parasitic infestations is one of the grave problems that lies before the scientific world. Each disease is a many-sided problem involving not only scientific but economic and social matters as well. It may be truly said that the author has done much to assist in the solution of these problems.

RECOVERY RECORD FOR USE IN TUBERCULOSIS, by *G. B. Webb, M. D., and C. T. Ryder, M. D.* Paul B. Hoeber (Inc.), New York, 1923.

Recognizing the fact that "in tuberculosis a careful record of the temperature and pulse is an indispensable guide for the conduct of the patient's life," the authors have written this clever little volume for the express use of the tuberculous patient for whom "recovery from tuberculosis is an adventure, with life itself as the goal of success."

The conspicuous feature of the volume is a series of charts, occupying the second half of the book, and sufficient in number to last two years, on which the patient may record temperature and pulse and weight or any events or symptoms of possible importance, "as well as those numerous questions which people want to ask the doctor when he is not there, and forget about when he comes."

As the authors state: "We have prepared this little almanac of recovery because we feel that a continuous chart of the temperature, pulse, and certain other features of the weather prevailing in the patient's body is essential in controlling and directing treatment. And we put it confidently into the hands of patients, because, if such a record is to be kept, they are usually the ones who must keep it, and because we know that nearly all of them can be trusted to do so. Most people are equal to what is demanded of them, and the cure of tuberculosis demands that one keep a strict watch on the slight variations of physical equilibrium, deriving encouragement when all goes well and caution, but not panic, when the smooth current of progress is temporarily checked."

Preceding the charts is a chapter on the "technique of recovery," in which are presented the fundamentals in the art of getting well; a chapter on the hygiene of recovery, in which diet, fresh air, keeping warm, cough and expectoration, amusements, and regular habits are discussed; a chapter on accidents and obstacles in which digestive difficulties, loss of appetite, nervousness, sleeplessness, headache, fever, sweating, pain, hemorrhage, and colds are presented in a cheerful manner. A spirit of optimism prevails throughout the volume that can not fail to encourage the patient. This is indicated by quotations which accompany each chart, by apt sayings in the text and even by the title of the book. "Be patient, be cautious, be serene," say the authors to the reader. "Consider your exile temporary and spare no pains and sacrifices to bring it to a happy end. Never lose interest in life, for life loves those who love her."

TOBACCO AND MENTAL EFFICIENCY, by *M. V. O'Shea, professor of education, University of Wisconsin.* The Macmillan Co., New York, 1923.

The personal consumption of tobacco in its various forms has risen in the United States from 1.8 pounds per capita in the years immediately following the Civil War to nearly 7 pounds per capita at the end of the World War. The production of cigarettes in particular, which had been about $3\frac{1}{2}$ billion in 1905, had risen to 46 billion in 1918. The cultivation of tobacco leaf requires the use of 1,647,000 acres of arable land. The amount spent on tobacco directly is estimated conservatively at over \$1,600,000,000 a year, not counting accessories, such as matches, pipes, etc., or the fire loss, of which smoking is now recognized to be the leading cause. The effects of a commodity which makes such enormous demands upon our natural resources can not be a matter of indifference. If its benefits are greater than its cost, they must be very great indeed. If less, then we ought to know what the loss is.

Teachers, clergymen, physicians, employers of labor are frequently called upon for advice by those who look to them for guidance in this matter, and they are interested in knowing whether tobacco as commonly used is a useful or a harmful element in our national life. There seems to be no authoritative source from which information on this subject can be derived. The consumption of tobacco is urged by the tobacco interests, while many individuals and associations advise against it.

The author of this volume, who is a prominent educator, with a view to securing reliable information regarding the effect of tobacco on a youth's mental development, reviewed the literature of the subject and in the end came to the conclusion that practically all that had been written on the influence of tobacco on mental function was based on the peculiar bias or prejudice of the authors. Consequently he decided to secure data himself on this subject which would not be colored by prejudice or propaganda. This book describes investigations that have been carried on for several years under his directions, together with the results that have been reached. An investigation into the habits of prominent persons of the past respecting the use of tobacco disclosed the fact that "most of the greatest men of the past three generations were smokers." In order to determine whether tobacco handicaps or helps men and women engaged in intellectual pursuits the author addressed a questionnaire to many individuals who have attained distinction in activities demanding mental efficiency. Among those who replied very few who smoke would admit that tobacco is detrimental either to health or to mental efficiency. A majority of them stated that they derive comfort and solace from tobacco and are able to do more intellectual work with

than without its use. The nonsmokers were quite reserved in their expressions regarding their observations. Referring to the use of tobacco by soldiers one general said: "When the men could smoke they seemed more contented and better able to endure hardships than when they were denied tobacco. Apparently cigarettes or cigars would quiet the nerves of men who were preparing to undertake a dangerous task." "There can not be any doubt," says the author in this connection, "that for most persons, at any rate, tobacco exerts a sedative influence upon the nervous system in its secondary, if not in its initial, effects. Ultimately, if not in the beginning, it renders one less sensitive to influences acting upon him than he was before its use. It tends to slow down cerebral activity."

A study of the questionnaires forces one to conclude that the use of tobacco can not be a detriment to the mental efficiency of all men. So far as the author's collected data show, men who use tobacco have achieved as much in every field of activity as the men who do not use it.

Observations among high-school pupils show that the nonsmoker has the advantage over the smoker. Baumberger and Martin, of the laboratory of physiology, Stanford University, have recently reported the results of an investigation which shows that smoking has a pronounced effect upon the fatigue and efficiency of telegraph operators.

However, there are so many factors operating to determine the effect of tobacco on intellectual processes that no definite conclusion regarding the matter can be reached unless these factors can be differentiated from one another and each subjected to careful scrutiny. It is manifestly impossible to accomplish this satisfactorily merely by a review of biological literature or by a study of the testimonies of men and women regarding the effect of tobacco upon their own mental activities.

Up to the present time very little has been done in the way of studying in a scientific manner the direct effect of tobacco as a drug upon the intellectual or body functions. The three or four studies which had been reported failed to eliminate the subject's personal interest, suggestion, or deprivation of tobacco without the subject's knowledge during the test. A clever technique and a method of procedure was devised by the author and his coworkers which controlled these factors, with the result that definite data concerning the influence of tobacco were obtained in a scientific manner. Observations were made on the pulse rate, the steadiness of muscular control, muscular fatigue, the keenness and accuracy of perception, and the facility in learning. The results show that tobacco in the case of the mature person tends to retard and to disturb intellectual proc-

esses, but not in a marked degree in the case of the particular physiological and motor processes which were investigated.

TONSILLECTOMY, by *Greenfield Sluder, M. D., clinical professor and director of rhinology, laryngology, and otology, Washington University School of Medicine, St. Louis.* C. V. Mosby Co., St. Louis, Mo., 1923.

The author in this monograph presents in a very clear manner his method of tonsillectomy by means of the eminence of the mandible and his specially designed guillotine.

The work is prefaced with brief chapters on the history of tonsillectomy, the embryology, the physiology, and general pathology of the tonsils, and very excellent chapters on the indications and prognosis for tonsillectomy.

The book is profusely illustrated. Each step of his operation is clearly described and illustrated so as to be easily grasped by the average physician.

In the final chapter Dr. I. D. Kelle, jr., associate of Doctor Sluder in the Washington University School of Medicine, describes a new instrument for the complete removal of adenoids by direct vision.

Cuts of the instrument and adenoids removed, with their capsule intact, are given.

THE TONSILS, by *Harry A. Barnes, M. D., instructor in laryngology, Harvard Medical School; laryngologist, Massachusetts Charitable Eye and Ear Infirmary.* Second edition. C. V. Mosby Co., St. Louis, Mo., 1923.

This is a very comprehensive book on the faucial, pharyngeal, and lingual tonsils. All the latest advances in the literature on the tonsils, both in their relation to systemic disease and the newer operative methods, have been included in this edition.

The chapters on anatomy, pathology, and bacteriology, and diseases of the tonsil, their diagnosis, treatment, and prognosis are excellent.

The present status of the X-ray and radium treatment of tonsillar conditions is clearly summed up.

This book well merits a place in the library of all naval surgeons.

THE INTERNATIONAL CLINICS, A QUARTERLY OF CLINICAL LECTURES AND ESPECIALLY PREPARED ORIGINAL ARTICLES. Edited by *Henry W. Cattell, A. M., M. D.* Thirty-third series. J. B. Lippincott Co., Philadelphia, 1923.

This publication affords the naval medical officer at sea an excellent means of becoming acquainted with the important advances in medicine and surgery. The second volume of the series for 1923, recently issued, contains, among other interesting matter, articles on insulin, tularæmia, the clinical value of electrocardiography, blood transfusion, roentgen rays in general practice, and the diagnosis and treatment of allergic diseases.

INSTRUCTIONS TO MEDICAL OFFICERS ISSUED BY THE BUREAU OF MEDICINE AND SURGERY.

Circular letter.
Serial No. 142-1921.

MEH:ESK 129733 (113).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 16 November, 1921.

To: All naval hospitals.

Subject: Inspection of naval hospitals by representatives of the U. S. Veterans' Bureau.

References: (a) U. S. Veterans' Bureau General Order No. 39, of October, 1921.

(b) U. S. Veterans' Bureau Field Order No. 23, of October 29, 1921.

1. The Director of the U. S. Veterans' Bureau is required by the Act of Congress approved August 9, 1921, to maintain a service of inspection. Section 3 of this Act reads, in part, as follows:

"In order to standardize the character of examination, medical care, treatment, hospitalization, dispensary and convalescent care, nursing, vocational training, and such other services as may be necessary under this Act, the director shall maintain an inspection service, with authority to examine all facilities and services utilized in carrying out the purposes of this Act. * * *

2. The policy of the Veterans' Bureau in connection with the inspection of Governmental Institutions is stated in paragraph 14 of reference (a) and paragraph 3 of reference (b).

3. This bureau is advised that, in general, inspections in naval hospitals will be in the nature of consultations with commanding officers, on matters pertaining to the welfare of the beneficiaries of the Veterans' Bureau, but it is not within the power of this bureau to define the limits of such inspections.

4. It is desired that commanding officers cooperate as fully as possible with the inspecting officers of the Veterans' Bureau.

E. R. STITT.

Circular letter.
Serial No. 148-1921.

WRJ:THC 125884 (113).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 17 November, 1921.

To: All naval hospitals.

Subject: Stub requisitions and job orders.

Reference: (a) Bureau's circular letter No. 125935-2 of October 1, 1916.

1. While the bureau does not desire to curtail the use of stub requisitions for material necessary for the *ordinary* maintenance of the hospital, it is com-

pelled, due to the limited appropriations, to establish a quarterly allowance that shall not be exceeded without reference to the bureau.

2. An analysis of stub requisitions for the months of July, August, and September of this year shows a wide difference in expenditures at hospitals of similar capacity and number of patients.

3. It is directed that hospitals submit estimates of the amounts that will be required as *quarterly* allotments, for material required from navy yards, for ordinary maintenance of the hospitals. In the preparation of these estimates the minimum amounts that will be required under each of the following headings will be given. No effort will be made to include estimates for probable emergencies. (See par. 4.)

CONSTRUCTION AND REPAIR.

(a) Under this heading will be included all material, tools, etc., used for ordinary repairs to buildings, furnishings, plant appliances, etc.

(b) Estimates for alterations, construction, or extensive repairs will be referred to the bureau in each instance as outlined under "Job orders."

(c) As a general guide, no material for a job the cost of which is more than \$25 will be included in this estimate.

CLEANING GEAR.

(d) All material used in cleaning wards, mess halls, etc., will be included in this estimate.

(e) The analysis of stub requisitions show a wide difference between the amounts used by hospitals of a similar type. It has been demonstrated by one hospital that by careful supervision of the issue and use of this class of material expenditures could be greatly reduced.

OFFICE SUPPLIES.

(f) Analysis of stub requisitions for material under this heading shows the greatest difference between hospitals doing practically the same amount of clerical work.

TRANSPORTATION SERVICE.

(g) Material, such as gasoline and oils, drawn from store for ambulances, trucks, or boats, will be included under this heading.

(h) All expenditures for this class of material are a charge against the appropriation "Contingent, M. & S.," a very small appropriation that is used for numerous purposes. Tires, spare parts, etc. (except gasoline and oil), when drawn from the navy yard will be drawn under authority of the approved annual requisition; stubs will show on their face that the expenditure is a charge against such requisitions; the requisition will be debited with the amount of such stub as though the purchase had been made in the open market. If requests for additional allotments under the annual requisition are made, the amounts paid by public bills and amounts drawn on stub will be shown.

MESS GEAR, KITCHEN AND PANTRY UTENSILS.

(i) No estimates will be made under this heading.

(j) The requirements for kitchen utensils, table linen, and mess gear will be limited to the items listed in reference (a), and open-purchase requisitions for these articles will not be submitted.

(k) Requisitions will be made by letter and will be forwarded to the bureau for approval. After approval by the bureau, a stub requisition will be prepared in the usual manner.

(l) The needs of the hospitals will be anticipated semiannually, in January and July.

(m) Commanding officers should establish a strict system of accountability for articles of mess gear in order to prevent loss and breakage through carelessness.

MISCELLANEOUS.

(n) Estimates under this heading would include any material that could not be included under any of the above headings—i. e., such supplies as alcohol, paper towels, flash lights, etc.

JOB ORDERS.

(o) It has repeatedly been brought to the attention of the bureau that articles repaired at navy yards have been returned with a charge in excess of the original cost.

(p) Requests for job orders will, in every instance, be submitted to the bureau for approval, except in case of sudden emergency that will not permit the delay incident to such approval.

(q) In order that the bureau may act intelligently on requests for job orders, the following information will be furnished therewith in each case:

(r) Repairs, equipment—

(s) Date of receipt; invoice or appraised value.

(t) Present condition.

(u) Estimated cost of replacement.

(v) Estimated cost of repairs, navy yard, outside.

(w) If work can be performed by hospital force, give cost of material required.

(x) Recommendations.

(y) Alterations and repairs, buildings and grounds—

(z) Present condition.

(aa) All facts as to why the alterations or repairs are necessary; the purpose to be served, etc.

(bb) Estimated cost, navy yard, outside.

(cc) If work can be performed by hospital force, give cost of material required.

(dd) Recommendations.

(ee) The quantity of material drawn from the navy yard or purchased in the open market for the work shall be restricted in every instance to that which is actually needed for the job concerned.

(ff) The bureau desires, whenever the best interests of the Government will be served, to replace worn-out equipment rather than spend large amounts on repairs. Commanding officers are directed to carefully consider the most economical plan before submitting recommendations.

FUEL, ETC.

(gg) Estimates will not include fuel, water, gas, electricity, etc.

4. In sudden emergencies that will not permit the delay incident to approval by the bureau, material or services to care for the emergency may be required in the usual manner. The copy of the stub requisition forwarded to the bureau will show on its face the nature of the emergency for which the material or services were required.

5. When hospitals are supporting other activities, such as in the case at Washington and Norfolk, an explanation will be given when requesting unusually large allotments.

6. The bureau's approval of a survey recommending property "Fit for use when repaired on ship or station" will not be construed as authority to send the property to the navy yard for repairs. If it is desired to have this work performed by the navy yard, a request may accompany the survey, the request to be prepared as outlined under "Job orders."

7. Allotments will be made as liberal as the limited appropriations of the bureau permit, and commanding officers will so administer their commands as to not only prevent the exceeding of their allotments but also prevent the necessity for requesting additional allotments, except under very unusual circumstances.

8. Estimates required above will be submitted in duplicate and will be made separate from the accompanying letter.

E. R. STITT.

Circular Letter.
Serial No. 144-1921.

MEH : ESK 129733 (114).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 5, 1921.

To: All naval hospitals.

Subject: Discharge of beneficiaries of the Veterans' Bureau.

Inclosure: Veterans' Bureau's letter, RWB/eus: 10. November 23, 1921.

1. The attached letter from the Director of the Veterans' Bureau, together with its inclosure, is forwarded for your information and guidance.

E. R. STITT.

129733 (114)

TREASURY DEPARTMENT,
Washington, November 23, 1921.

In reply refer to:
RWB/eus: 10
Hospital section.

THE SURGEON GENERAL, U. S. NAVY,
Washington, D. C.

SIR: Our records tend to show that in spite of our desire to use Government hospital beds we are using contract hospital beds in about the same proportion as heretofore.

It is possible that our patients in Government hospitals are not being discharged when they have no further need of hospitalization.

It is requested that you refer to paragraph 2 of Veterans' Bureau General Order No. 26, dated September 6, 1921, and our letter to the district managers, dated October 15, 1921, a copy of which is inclosed, and that you request your various officers in charge of hospitals to cooperate as far as possible with the spirit of our orders.

This office realizes that in many instances a delay in the actual discharge of patients from hospitals may be occasioned in our district offices.

Such help as you may be able to give this matter will be appreciated.

Respectfully,

Inclosure (1).

C. R. FORBES,
Director U. S. Veterans' Bureau.

(Copy.)

RUP-vef-10.

OCTOBER 15, 1921.

129733 (114).

DISTRICT MANAGER, DISTRICT No. 1,

U. S. VETERANS' BUREAU,

Washington-Essex Building, Boston, Mass.

DEAR SIR: Referring to General Order, No. 26, and to paragraph No. 2, which reads as follows:

"All patients now in hospitals in your district who do not require further hospital treatment will be given four days' notice to make their personal arrangements and will then promptly be discharged from hospital. Each patient discharged under existing regulations will be furnished transportation to his bona fide legal residence in the United States or to the place from which he was hospitalized. Notification of such discharge will be sent immediately by the officer in charge of the institution caring for the beneficiaries of the U. S. Veterans' Bureau to the district manager of the district in which the institution is located."

(Copy.)

129733(114).

OCTOBER 15, 1921.

DISTRICT MANAGER, DISTRICT No. 1.

In complying with these instructions, and before authorizing discharge of patients of the U. S. Veterans' Bureau from hospitals, district managers will determine:

(1) Whether the patient is in need of out-patient treatment in a dispensary or convalescent care. If so, district managers will make necessary arrangements to continue the treatment indicated after discharge of the patient from the hospital.

(2) Whether the patient desires vocational training. If so, his eligibility and feasibility will be determined and arrangements made for placing him in training promptly upon his discharge from the hospital.

(3) Necessary adjustment or readjustment of all matters pertaining to his compensation will also be completed promptly upon his discharge from the hospital.

In order to accomplish the above, patients of the U. S. Veterans' Bureau will not be discharged from hospitals until district managers or their local representatives have been notified and the necessary arrangements made by them for determining the above factors, and upon which the district managers or their representatives will approve discharges and notify the hospital authorities accordingly.

Whenever it becomes necessary, in order to expedite the action desired, district managers should delegate authority to representatives living or stationed in the neighborhood of the hospitals concerned. The discharge of patients, when further hospital treatment is no longer necessary, must not be delayed unnecessarily by representatives of the bureau.

Instructions contained in this communication do not apply to the provisions of General Order No. 27, regarding the discharge of patients for disciplinary reasons.

To make this effective, letters have been sent to the heads of all the governmental medical services caring for beneficiaries of this bureau, requesting their

cooperation and that they issue the necessary orders to medical officers in charge of the hospitals of their respective services.

The provisions of this letter will be confirmed by a general order as soon as the same can be prepared.

Very truly, yours,

ROBT. U. PATTERSON,
Assistant Director, U. S. Veterans' Bureau.

Circular letter.
Serial No. 145-1921.

SDS: WHM

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 6 December, 1921.

To: Medical officers in command, all hospitals.

Subject: Abbreviation to be used in reporting U. S. Veterans' Bureau patients on statistical reports.

1. It is directed that the abbreviation "VBP" be used in reporting U. S. Veterans' Bureau patients on statistical returns to this bureau (forms I and F).

E. R. STITT.

Circular letter.
Serial No. 146-1921.

WSG/T 129733(104).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 6, 1921.

To: All naval hospitals.

Subject: Transportation of beneficiaries and claimants of the Veterans' Bureau.
Reference: Veterans' Bureau 2d endorsement, RWB/jat:10, hospital section, November 14, 1921.

1. The following statement was made (reference) in reply to an inquiry from this bureau, and is communicated for the further information of all naval hospitals:

"1. An opinion from our general counsel this date states that beneficiaries of the U. S. Veterans' Bureau who are discharged from hospital on completion of treatment are entitled to transportation to their homes. This transportation is authorized whether or not they have been furnished mileage by the Army or Navy upon their discharge.

/s/ ROBT. U. PATTERSON,
Assistant Director U. S. Veterans' Bureau."

2. It is desired that this information be made familiar to all members of the staff, and to the beneficiaries concerned.

E. R. STITT.

Circular letter.
Serial No. 147-1921.

WSG/T 125330(113).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 6, 1921.

To: All naval hospitals and naval medical supply depots.

Subject: Use of Government vehicles.

1. The following quoted letter from the chief coordinator has been sent to the heads of all Executive Departments:

"Statute L., vol. 33, sec. 4, February 3, 1905, forbids the use of Government vehicles for private purposes.

"There has been observed in the City of Washington a large amount of improper use of Government motor vehicles, in most cases passenger cars which are assigned to officials and officers for official use.

"Ladies who are not employees of the Government use official cars for marketing purposes and for making personal social calls, while other Government cars have been seen at football games, theaters, etc.

"It is readily apparent that such use of Government automobiles, involving heavy expenditure of public funds, must be discontinued.

"It is requested that this matter be brought to the attention of all officials, officers, and employees of your department to the end that further use of Government motor transportation for private purposes shall cease.

"The local motor transport coordinator has been directed to report all instances of violation of the above-mentioned statute and each case will be dealt with as the facts may warrant.

/s/ "H. C. SMITHER,

"Chief Coordinator, General Supply."

2. It is directed that this letter be brought to the attention of all officers.

E. R. STITT.

Circular letter.

WSD/JBC. 124942-0.

Serial No. 148—1921.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 16, 1921.

To: All naval hospitals (continental limits), naval hospital, Pearl Harbor, sick quarters, Marine Barracks, Quantico, Va.

Subject: Civilian employees; semi-monthly pay periods; preparation of pay rolls; time and pay-roll record; service card.

Reference: M. and S. circular letter, serial No. 98—1921, No. 124942(22), May 24, 1921.

1. Beginning January 1, 1922, it is directed that all civilian employees at naval hospitals shall be paid twice each month only. The first pay period shall be from the 1st to the 15th day of the month, and the second pay period shall be from the 16th to the last day of the month.

2. If practicable, the names of the employees shall be arranged on the pay roll in the order in which the various ratings appear on the schedules of wages, as follows, which will bring together those exempt from retirement deductions:

Schedule J.—Hospital service.

Schedule K.—Laborer, helper, and mechanical service.

Group I.

Group II.

Group III.

Group IVa.

Schedule A.—Clerical service.

Group IVc (other than clerical force).

Group IVc (clerical force). Clerical employees paid from funds allotted by the Veterans' Bureau shall be shown separated from clerical employees of the hospital proper, under the heading "Veterans' Bureau Allotment."

TEMPORARY EMPLOYEES.

Employees authorized for limited periods shall be carried on the pay roll after all other employees, under the heading "Temporary employees."

3. This arrangement can most readily be put in effect by assigning a block of pay-roll numbers to each group to cover changes in the numbers incident to the "turnover" in personnel. Thus the hospital service may be assigned pay numbers 1 to 99; Group I, 100 to 149; Group II, 150 to 199; Group III, 200 to 299; and so on, the size of the block assigned depending on the number of employees in the group.

4. A carbon or other copy of the pay roll for each period shall be transmitted to the bureau promptly.

5. A supply of the new form (N. M. S. Hospital Form No. 62) for time, pay roll, and service record will be forwarded under separate cover and will be placed in use beginning January 1, 1922. Additional copies may be obtained from the Navy Medical Supply Depot, Brooklyn, N. Y., as required. This form was devised after securing suggestions from all naval hospitals, has been approved by practically all of the hospitals as now prepared, and should be used in connection with S. and A. Form 206-C, Leave card. Suggestions for changes in the hospital form may be submitted after it has been in use for a period of six months.

E. R. STITT.

Circular letter.
Serial No. 149-1921.

SDS.
WHM/m 124842 (123).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 16 December, 1921.

To: All medical officers.

Subject: Review and initialing of all Form F cards by senior medical officers before same are forwarded to the Bureau of Medicine and Surgery.

Reference: (a) Bulletin No. 110 "Notes on Preventive Medicine for Medical Officers, U. S. Navy," pages 17 and 19, under instructions for the preparation of Form F card.

1. In view of the large number of incorrect Form F cards received in the bureau it is evident that medical officers are not giving the necessary attention to the preparation of these cards.

2. As a result of frequent errors on Form F cards the preparation of morbidity statistics is delayed in the bureau. In order to reduce this to a minimum it is directed that before such cards are forwarded to the bureau that they be initialed in the lower right-hand corner by the senior medical officer of the ship or station. All Form F cards should be compared with the admission covered by the report in the health record to make certain that they are correct in every detail.

3. At large hospitals and training stations this duty may be delegated to a responsible officer.

E. R. STITT.

Circular letter.
Serial No. 150-1921.

WSG/T 128586 (123).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 19, 1921.

To: All naval hospitals.

Subject: Retention of certain officers and enlisted men for treatment.

References: (a) Section 2 of naval act approved June 4, 1920.

(b) Article 1203 (7), Navy Regulations.

1. As the service connection of certain officers holding temporary appointments automatically expires (ref. a) on December 31, 1921, it is authorized

where they are in need of further hospitalization, in the opinion of the commanding officer, they may be retained in hospital under treatment as supernumeraries.

2. This retention shall be only for those who voluntarily request further treatment; and shall be compulsory only for those who are mentally incapacitated and who would be a menace to the community if discharged.

3. The officers affected by this authorization will be informed by the commanding officer.

4. Special attention is also invited to reference (b) as follows:

"Enlisted men held for treatment at a hospital after expiration of enlistment are held for the convenience of the Government, and are entitled to pay and allowances until date of actual discharge from the service."

E. R. STITT.

Circular letter.
Serial No. 151-1921.

WSD/SAB 124942-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 20, 1921.

To: All naval hospitals (continental limits), naval hospital, Pearl Harbor, Hawaii, sick quarters, Marine Barracks, Quantico, Va.

Subject: Civilian employees; computation of monthly pay.

1. It has been brought to the attention of the bureau that at some of the hospitals the monthly pay of civilian employees is not being computed correctly.

2. By the Secretary's letter of September 9, 1920, it was directed that the rates of pay of all civilian employees at naval hospitals be fixed on a per monthly basis, computed as 26 times the per diem rate of pay for the corresponding rating on the current schedule of wages. The method of computing the monthly pay is somewhat modified in paragraph 17 of the General Instructions supplementing inclosure K (Schedule of wages for employees under the Naval Establishment—Laborer, helper, and mechanical service), accompanying the Secretary's letter of September 6, 1921, but the basis remains the same.

3. After the monthly pay has been correctly computed by multiplying the per diem or per hourly rate by 26 or 208, respectively, the resulting figure is the per monthly pay of the employee, and the per diem or hourly rate used in the computation is no longer a factor in his pay, which is thereafter handled in multiples of 30.

4. For example, the scheduled rate of pay for a chauffeur is 49 cents per hour. The monthly pay of a hospital chauffeur, therefore, would be 208 times 49 cents or \$101.92. His daily pay would not be 8 times 49 cents or \$3.92, but one-thirtieth of \$101.92 or \$3.39 plus. This fractional difference is arbitrarily adjusted by making the pay for 22 days \$3.40 per diem and for 8 days \$3.39 per diem, the odd pay being evenly distributed throughout the 30-day period, on the 1st, 5th, 9th, 13th, 17th, 21st, 25th, and 29th. The deduction for each day of leave without pay (or other nonpay status) in this case would be \$3.39 or \$3.40, whichever might be required to bring the total monthly pay to the correct figure, \$101.92.

5. Likewise, for employees placed on a part-time basis under the provisions of ALNAVSTA 3, the daily pay is 1/30th of the monthly pay, which is the sum obtained by multiplying the amount given in the schedule of wages by 22 or 176, as the case may be. Employees who are placed on the 22-day or 176-hour basis will not be required to work Saturdays.

58448-23-6

6. The following instructions, quoted from the circular of the Office of the Comptroller of the Treasury, Treasury Department, Washington, March 24, 1917, explain in detail the method which should be followed in computing the monthly compensation for services rendered the United States:

SEC. 6. Hereafter, where the compensation of any person in the service of the United States is annual or monthly, the following rules for division of time and computation of pay for services rendered are hereby established:

Annual compensation shall be divided into twelve equal installments, one of which shall be the pay for each calendar month; and in making payments for a fractional part of a month one-thirtieth of one of such installments, or of a monthly compensation, shall be the daily rate of pay. For the purpose of computing such compensation and for computing time for services rendered during a fractional part of a month in connection with annual or monthly compensation, each and every month shall be held to consist of thirty days, without regard to the actual number of days in any calendar month, thus excluding the thirty-first of any calendar month from the computation and treating February as if it actually had thirty days. Any persons entering the service of the United States during a thirty-one day month and serving until the end thereof shall be entitled to pay for that month from the date of entry to the thirtieth day of said month, both days inclusive; and any person entering said service during the month of February and serving until the end thereof shall be entitled to one month's pay, less as many thirtieths thereof as there were days elapsed prior to date of entry. *Provided*, That for one day's unauthorized absence on the thirty-first day of any calendar month one day's pay shall be forfeited.

This act is construed as requiring that—

1. Each calendar month shall consist of thirty days, and the computation of salary shall be by each month separately, one-twelfth of an annual salary constituting the compensation for each month.

2. One-thirtieth of a monthly installment of salary is to be allowed for each day of service from the first to the thirtieth, inclusive. The last day of February counts as three days of service for pay purposes (two days in leap year).

3. The thirty-first day of a month enters into the computation of salary only where there is one day's absence in a nonpay status on that day—that is, absence in a nonpay status did not occur also on the thirtieth. For such absence on the thirty-first one day's pay is forfeited.

E. R. STITT.

Circular letter.
Serial No. 152-1921.

WSD/JBC 124677-O (123).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 22, 1921.

To: All naval hospitals.

Subject: Disposal of remains of supernumerary patients who die in naval hospitals.

Reference: (a) Naval act of July 12, 1921.

(b) Decision of Comptroller General, November 25, 1921, in the case of Maj. Paul Chamberlain, U. S. Marine Corps, retired.

1. The current naval appropriation act, under the appropriation "Contingent, Bureau of Medicine and Surgery," contains the following language:

"For * * * care, transportation, and burial of the dead, including officers who die within the United States, and *supernumerary patients who die in naval hospitals*: * * *."

This language with regard to supernumerary patients first appeared in the naval act of July 11, 1919, having been recommended by this bureau specifically to provide authority of law which would enable the Navy to make proper disposal, in event of death, of the remains of patients who, although not on the active lists of the Navy or Marine Corps, are entitled by law or Navy Regulations to hospitalization, i. e., retired officers and enlisted men, pensioners, officers and men transferred to the Fleet Naval Reserve after 16 or more years' service, and men retained in naval hospitals for treatment after expiration of enlistment or discharge.

2. By his above-mentioned decision the Comptroller General has construed the word "supernumerary," as it appears in the appropriation "Contingent, Bureau of Medicine and Surgery," to mean only men whose terms of enlistment have expired while sick in hospitals. As it is well understood that funeral expenses are payable by the Government only when specific provision is made therefor by law, and as the appropriations contained in the naval act are available only for expenses incurred on behalf of persons who have died while in active service, the result of this decision is to prohibit the Navy from incurring expenses for the "care, transportation, and burial," of any class of supernumerary patients except men whose terms of enlistment have expired while sick in hospitals.

3. Veterans' Bureau patients are not affected by this decision.

4. Until this situation can be remedied by a rewording of the appropriation, it will be necessary for the hospitals to inform the next of kin of deceased supernumerary patients (with the one exception noted) that there is no authority of law by which the Navy can defray expenses for the care of the body, either in connection with transportation or burial. Their naval service, of course, entitles them to burial in a national or naval cemetery, but the expenses incident to preparation for such burial or of transportation to such cemetery can not be borne by the Navy.

5. However, should such supernumerary patient die in destitute circumstances, or should not the next of kin claim the body, it then devolves upon the hospital to make local burial, authority for defraying burial expenses under these conditions, as a charge against the appropriation "Contingent, Medicine and Surgery," having been given in the decision of the Comptroller of the Treasury dated July 24, 1914. (S. and A. Memoranda, vol. 6, p. 3322.)

6. The remains of men who die while being retained in hospital for treatment after discharge will be handled in the same manner as if death had occurred while in the service, except that expenses for transportation will be a charge against "Contingent, Medicine and Surgery," instead of "Bringing home remains of officers, etc., Navy Department."

7. In this connection attention is invited to article 1203(7), Navy Regulations, and this bureau's circular letter, serial No. 150-1921, No. 128586, December 19, 1921.

E. R. STITT.

Circular letter.
Serial No. 153-1921.

WRJ/T 125884 (124).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 29, 1921.

To: All naval hospitals.

Subject: Summary of maintenance expenditure report—Hospital Form 34 A.

Reference: Bureau's circular letter No. 132683(62) of June 16, 1921.

1. Beginning with the first quarter of the present fiscal year the "Summary of maintenance expenditure report," Hospital Form No. 34 A, will be submitted quarterly.

2. Reports from hospitals within the continental limits of the United States will be mailed so as to reach the bureau not later than the last day of the month following the quarter for which the report is submitted.

3. Reports from hospitals without the continental limits of the United States will be mailed not later than the 15th of the month following the quarter for which the report is submitted.

4. In addition to the statement required on face of summary (inclosure with ref. a), the total number of sick days for (a) naval patients, (b) Veterans' Bureau patients, and (c) supernumerary patients will be given separately.

5. The above report is required to enable the bureau to prepare periodical reports required by the Bureau of the Budget and the Veterans' Bureau.

6. Hospitals which, in compliance with a recent request (dated Dec. 1, 1921), submitted reports for the quarter ended September 30, 1921, will not be required to duplicate such reports for that quarter.

E. R. STITT.

Circular letter.
Serial No. 154-1922.

WSD/JBC 129733.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., January 6, 1922.

To: All naval hospitals.

Subject: Transportation of remains of Veterans' Bureau patients.

Reference: (a) M. & S. circular letter, serial No. 63-1920, No. 129733(54),
October 22, 1920.

(b) M. & S. circular letter, serial No. 115-1921, No. 124677-0, August
2, 1921.

1. In order that charges for transportation of the remains of Veterans' Bureau patients who die in naval hospitals and are sent to their homes for burial may be paid by the Veterans' Bureau, it is directed that hereafter the following entry be typewritten across the face of all copies of the bill of lading by which such dead are transported. This entry may be placed directly below the red lettering on the bill:

"TRANSPORTATION CHARGES UNDER THIS BILL OF LADING ARE PAYABLE BY THE U. S. VETERANS' BUREAU, WASHINGTON, D. C., IN ACCORDANCE WITH THE BUREAU OF WAR RISK INSURANCE LETTER DATED OCTOBER 16, 1920."

E. R. STITT.

Circular letter.
Serial No. 155-1922.

WSD/JBC 124942-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., January 6, 1922.

To: All Naval Hospitals (continental limits); naval hospital, Pearl Harbor, Hawaii; sick quarters, Marine Barracks, Quantico, Va.; naval dispensary, Washington, D. C.; Naval Medical School.

Subject: Civilian employees; computation of monthly pay.

Reference: Bureau's circular letter, serial No. 151-1921, No. 124942-O, December 20, 1921.

Inclosure: Copy of letter No. 124942, January 5, 1921, to naval hospital, Mare Island, Calif.

1. As there appears still to be some uncertainty with regard to the method of computing the monthly pay of civilian employees, the inclosed letter is hereby made applicable to all organizations above addressed.

2. Under separate cover, the bureau is inclosing a copy of the "Government Salary Tables," 1920 edition, which may be of assistance in indicating the standard method of computing monthly pay. An endeavor is being made to obtain copies of an earlier edition, giving the basic monthly and daily rates of pay without deductions for retirement fund, which would be of greater value, as the rates correspond more nearly to those of the hospitals.

E. R. STITT.

WSD/JBC 124942.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., January 5, 1922.

To: Naval hospital, Mare Island, Calif.

Subject: Civilian pay roll for November, 1921.

Reference: M. & S. circular letter, serial No. 151-1921, No. 124942-O, December 9, 1921.

1. In examining your pay roll for the period of November 1-15, 1921, the following discrepancies are noted:

(a) Pay number 104, Grayson, A. W., fireman; pay per month, \$108.16; number of days, 12; regular compensation, \$49.92. A deduction of \$4.16 is made, although there is no explanation. If this man was absent in a nonpay status for one day the deduction should have been either \$3.80 or \$3.61. His monthly pay being \$108.16, his daily pay is for 16 days of the monthly period \$3.61 and 14 days \$3.60, the odd and even days being arbitrarily distributed as equally as possible throughout the 30-day period.

(b) Pay number 39, Fritsche, Frank E., machinist; pay per month, \$151.84; number of days, 7; regular compensation, \$40.88; amount paid, less 2½ per cent retirement reduction, \$39.86; remarks, L. W. O. P., 11-1 to 11-6-21. The monthly pay in this case is correct, but in calculating the pay for the period November 1 to 15 as \$40.88 an error has been made. His daily pay is \$5.84 (8×73 cents, the hourly rate given in the schedule of wages). The pay of this employee for one day is one-thirtieth of \$151.84, or \$5.06 2/15, the fraction being arbitrarily absorbed by making the pay for 26 days of the monthly period \$5.06, and for 4 days (7th, 14th, 21st, and 29th) \$5.07. Hospital employees are not on an hourly or daily pay basis but are on a monthly or 30-day basis, being paid for Sundays. This employee is stated to have been absent in a nonpay status for six days, November 1 to 6, inclusive, the sixth day being Sunday. Article 404 (11) Naval Instructions, directs that—

"Sundays or legal holidays occurring within a period of sick leave or leave without pay will be charged, but when occurring at the beginning or ending of such absence will not be charged."

(NOTE.—For employees on a reduced time basis, Saturdays occurring within a period of leave without pay are construed the same as Sundays or legal holidays.)

Accordingly in this case the deduction for leave without pay should be for 5 days at \$5.06 per day, or \$25.30. His pay for the first half of November, therefore, should be \$75.92 minus \$25.30, or \$50.62 instead of \$40.88. He is paid for 10 days, 8 at the rate of \$5.06 and 2 at \$5.07.

2. For each day of absence in a nonpay status during a 30-day month, one-thirtieth of the monthly pay of the employee is deducted from his total monthly pay. The following decisions (13 Com. Dec., 205) have been rendered on this point with regard to the 28 and 31 day months:

(a) When an employee is absent without authority or in a nonpay status one day in a 31-day month, he is entitled to twenty-nine thirtieths of his

monthly compensation, one-thirtieth of his monthly compensation being deducted for his absence.

(b) When an employee is absent without authority two days in February, he is entitled to twenty-eight thirtieths of his monthly compensation, two-thirtieths being deducted on account of his two-day absence in nonpay status.

(c) When an employee serves from the 1st to 15th, inclusive, of February and is granted leave without pay until the 28th of February, he is entitled to seventeen-thirtieths of his monthly compensation, thirteen-thirtieths being deducted on account of his 13-day absence without pay.

3. With regard to the comptroller's decision that—

"The thirty-first day of a month enters into the computation of salary only where there is one day's absence in a nonpay status on that day—that is, absence in a nonpay status did not occur also on the thirtieth. For such absence on the thirty-first one day's pay is forfeited."

It should be clearly understood that for one day's absence in a nonpay status on the 31st alone, one day's pay is forfeited. But if absence in nonpay status also occurred on the 30th—that is, on both the 30th and 31st—the 31st does not enter into the computation, and the employee is charged only for the 30th. Thus, if present from the 1st, to and including the 29th, and absent in nonpay status on the 30th and 31st, he would be paid twenty-nine thirtieths of his monthly pay.

4. The question of absence without leave and leave without pay (leave in excess of the 30 days allowed by law) is an administrative one. An employee persistently absenting himself without permission is an undesirable factor and should be discharged (see department's circular letter No. Bg-Wo, February 21, 1921, regarding procedure in cases of employees absent for six successive musters); while the granting of leave without pay in addition to 30 days with pay is an indication of excess personnel. An organization operating with the minimum force required can not spare the services of an employee for more than the legal period of leave with pay. Leave without pay should not be granted until all annual leave has been exhausted, and then only in emergency.

5. It must be understood that for hospital employees the per diem or hourly rate given in the schedule of wages is used only as a basis for calculating monthly pay. It is the desire of the department that all employees under the Naval Establishment shall be paid at equal rates, but in recognition of the somewhat different conditions at naval hospitals, where emergencies in connection with care of the sick render the fixing of definite hours of labor impracticable, hospital employees are paid a monthly rate of 26 times the per diem of the corresponding yard rating, 26 being the average number of days in a month for which a yard employee is paid. Ordinarily the pay of the yard employee for 26 days and the hospital employee for one month will be the same, but in February and in any 30-day month in which five Sundays occur the hospital employee will receive more pay. On the other hand, he is subject to call, when necessary, for work in excess of eight hours or on Sunday without extra pay.

6. An employee who works each week day from the 1st to the 15th, or from the 16th to the end of the month, should be credited in the "number of days" column of the pay roll with 15 days, as he is paid for 30 days each month, including Sundays.

7. Likewise, an employee on a reduced-time basis, under Article 3, who works every week day except Sunday should be credited with 15 days at the reduced monthly rate, as he is constructively present both on Saturday and Sundays.

For example, a machinist on a full-time basis who works all week days from the 1st to the 15th should be paid $15 \times \$5.06$, two-fifteenths, or \$75.92; and one on a reduced-time basis who works all week days except Saturdays should be paid $15 \times \$4.28$, four-fifteenths, or \$64.44. The "pay per month" column will indicate whether the employee is on a full or reduced-time basis.

8. An employee laid off on each Saturday, under Alnavsta 3, is on a monthly pay basis of 22 times the yard rate, or the average number of days for which a yard employee is paid. Hospital employees on this reduced monthly basis, while subject to overtime and Sunday work without additional compensation, can not be required to work on Saturday at the reduced monthly pay, as the pay for Saturday has been specifically eliminated. If, due to some emergency, such an employee should be called to duty on Saturday, he will be paid for that day one-thirtieth of the full-time pay of his rating.

E. R. STITT.

N-5/F/McL 5511-379.

NAVY DEPARTMENT,

BUREAU OF NAVIGATION,

Washington, D. C., 27 December, 1921.

Bureau of Navigation Circular Letter No. 43-21.

To: All ships and stations.

1. In reviewing the proceedings of the courts of inquiry and boards of investigation convened to inquire into the circumstances attending the deaths of Anton Huhn, late seaman second class, United States Navy, and John J. Morrill, late seaman second class, United States Navy, on the U. S. S. *Huron*, and of William Sabon, late seaman first class, United States Navy, on board the U. S. S. *Hopkins*, the bureau notes that in each case death was the result of asphyxiation while working in an insufficiently ventilated compartment.

2. The accident on the *Huron*, which occurred in a hold of that vessel in which flour was stored, discloses the fact that carbon dioxide is generated from stored wheat and its products. While figures showing the exact amount of carbon dioxide generated are not available, the quantity is generally considered small and negligible where the flour is stored in a manner permitting free ventilation; in the absence of ventilation, however, carbon dioxide will accumulate and vitiate the air of a storeroom to a considerable extent, particularly in cases where the amount of unoccupied space in the room is small. The quantity of carbon dioxide thus developed is usually greatly increased if the flour contains a relatively large amount of moisture or if infested with insects, but it may appear in the presence of apparently good flour.

3. The death on board the U. S. S. *Hopkins* occurred in the chain locker of that vessel during the process of tiering the anchor chain. A coat of black boot topping was being applied to the chain on deck, and the men were working in shifts tiering it as it came below. Since the testimony indicates that all usual precautions had been taken to assure the proper ventilation of this compartment, and an accident nevertheless occurred, it seems quite apparent that ordinary precautions are not always adequate to insure safety.

4. The above information is promulgated to the service in order to emphasize the necessity of utilizing every available means properly to ventilate below-deck compartments prior to the entry of personnel, and all commanding officers are therefore directed to take appropriate steps on board the vessels under their command to prevent future accidents of this nature.

PHILIP WILLIAMS, Acting.

Circular letter.

Serial No. 156-1922.

DCC: SMS 129733 (54).

WASHINGTON, D. C., *January 16, 1922.*

To: All naval hospitals.

Subject: Weekly report of Veterans' Bureau patients.

Reference: (a) Bureau's telegram of August 18, 1920.

(b) Bureau's circular letter No. 56-1920 of September 18, 1920;
129733(54).

1. The above references are hereby revoked.

2. Hereafter the report of Veterans' Bureau patients shall be made by telegraph as soon as possible on Friday morning of each week.

3. The telegraphic report shall contain the following information: Number of Veterans' Bureau patients admitted, discharged, and remaining; number of general, tubercular, or psychiatric patients; number of available beds remaining (this data shall be for the week ending Thursday midnight).

Example. Veterans' Bureau patients admitted, 10; discharged, 6; remaining, 30 (general, 25; tubercular, 4; psychiatric, 1); available beds, 120.

4. Available beds are those assigned to Veterans' Bureau patients which are vacant and available for these patients.

5. If there has been no change from the previous week, a statement to this effect is all that is necessary.

6. There has been much delay in transmission of the weekly report to the Veterans' Bureau owing to remissness in some of the naval hospitals in not forwarding the telegraphic report promptly. It is directed that in the future each hospital promptly send in the report in order to facilitate the transmission of the report of this bureau to the Veterans' Bureau.

7. The bureau desires a report by letter covering the period from January 1, 1922, to the first report sent in under this circular letter, giving the data requested in paragraph 3.

E. R. STITT.

Circular letter.

Serial No. 157-1922.

WSD/JBC 124942-O(13).

WASHINGTON, D. C., *January 17, 1922.*

To: All naval hospitals; sick quarters, Marine Barracks, Quantico, Va.; naval medical supply depots; naval medical school; all naval dispensaries.

Subject: Civilian employees; establishment of base complements.

Reference: (a) M. & S. circular letter series No. 84-1921, No. 124942-O(33),
March 16, 1921.

(b) M. & S. circular letter serial No. 87-1921, No. 124942-O(34),
March 21, 1921.

(c) M. & S. circular letter serial No. 92-1921, No. 124942-O(42),
April 9, 1921.

(d) M. & S. circular letter serial No. 116-1921, No. 125884(83),
August 15, 1921.

Inclosures: Copies of form for report of authorized complement.

1. By references it has been directed that the civilian force under the Medical Department be reduced to the lowest number consistent with proper care of the sick and reasonable upkeep of buildings and grounds, and that no employees of any character, except replacements within the reduced numbers, should be taken on without the prior approval of the bureau.

2. Upon the basis that all Medical Department activities are at present operating with the minimum number of employees, the bureau desires to establish for each activity a definite base complement, which shall not be exceeded without specific authority.

3. It is directed, therefore, that each of the activities addressed shall immediately submit a report in triplicate (on attached forms) showing the number of civilians at present employed in each rating. Employees authorized for care of Veterans' Bureau patients will be listed separately from those which constitute the regular complement of the hospital, as will also "temporary" employees authorized for limited periods, and the date of expiration of such authority will be shown. This form, when returned approved, will constitute the base complement of civilian employees, and each activity will be held to that base until modified by the bureau, except, of course, the numbers can and will be reduced whenever the services of employees are no longer necessary.

4. The hospitals also will report the numbers (by ratings) employed in each of the following departments: Cleaning force (janitors, laborers, etc.), maintenance force (upkeep and repair of buildings), gardener's force (upkeep of grounds, walks, roadways, etc.), power house, machine shop, garage, kitchen and scullery, mess halls, laundry, nurses' quarters.

F. L. PLEADWELL, *Acting.*

U. S. _____

_____ Date _____

REPORT OF CIVILIAN FORCE AUTHORIZED AND NOW EMPLOYED.

HOSPITAL SERVICE.

Rating.	Number employed, naval activities only (regular force).	Number employed, specifically for Veterans' Bureau patients.	Number employed, for limited period, with date of expiration.
Baker.....			
Chief cook.....			
First cook.....			
Second cook.....			
Dietitian.....			
Housekeeper.....			
Maid.....			
Meat cutter.....			
Chief mess attendant.....			
Mess attendant.....			
Pantryman.....			
Chief launderer.....			
First launderer.....			
Second launderer.....			
Third launderer.....			
Total base pay per month.....			

LABORER, HELPER, AND MECHANICAL SERVICE.

Rating.	Number employed, naval activities only (regular force).	Number employed, specifically for Veterans' Bureau patients.	Number employed, for limited period, with date of expiration.
Janitor.....			
Laborer.....			
Helper, general.....			
Helper, laboratory.....			
Helper, machinist.....			
Helper, wood worker.....			
Helper.....			
Helper.....			
Helper.....			
Laborer, classified.....			
Stablekeeper.....			
Teamster.....			
Boxmaker.....			
Cementer.....			
Chauffeur.....			
Electrician.....			
Engineman.....			
Fireman.....			
Gardener.....			
Joiner.....			
Machinist.....			
Mason.....			
Packer.....			
Painter.....			
Pipefitter.....			
Plasterer.....			
Plumber.....			
Sewer.....			
Water tender.....			
Chief mechanic.....			
Assistant chief mechanic.....			
Head mechanic.....			
Head motor mechanic.....			
Head janitor.....			
Head laborer.....			
Head painter.....			
Total base pay per month.....			

CLERICAL SERVICE.

Rating.	Number employed, naval activities only (regular force).	Number employed, specifically for Veterans' Bureau patients.	Number employed, for limited period, with date of expiration.
Supervising clerk.....			
Head stockman.....			
Stockman.....			
Clerk.....			
File clerk.....			
Bookkeeper.....			
Stenographer.....			
Typewriter.....			
Telephone switchboard operator.....			
Messenger.....			
Store laborer.....			
Roundsman.....			
Policeman.....			
Total base pay per month.....			

Circular Letter.

HWS : MFD 125561 (21).

Serial No. 158-1922.

WASHINGTON, D. C., 1 February, 1922.

To: All medical officers.

Via: Commanding officers.

Subject: Circular of information.

Reference: (a) General Order No. 69, of 16 September, 1921.

(b) U. S. Naval Medical Bulletin, March, 1922.

1. Venereal diseases are so injurious to the individual and inflict so much damage on the Navy, both in diminishing efficiency by accumulation of sick days and in lowering morale by creating a numerous body of persons ill disposed toward the Navy by reason of the penalties imposed by existing laws, that the department, after extended consideration of the seriousness of the problem presented, and of the various methods heretofore employed in dealing with it has reached the conclusion that there exists an imperative obligation to neglect no possible means of reducing their incidence.

2. Two points having an important bearing on the continued high venereal disease rate have recently come to the attention of the bureau. One is the statistical demonstration that up to four hours the incidence of disease increases with the time elapsing between exposure and the application of prophylactic measures, prophylaxis being apparently of no value after three hours. The other is that 55.4 per cent of infections are of distant origin—that is, acquired while men are on leave or extended liberty.

3. The value of early prophylaxis having been demonstrated so conclusively it is not considered just that any men should by the circumstance of independent duty, leave, or liberty, be excluded from its benefits. Hence the bureau has decided to authorize medical officers to issue on request compound calomel ointment, a preparation that is effective against both Neisserian and luetic in-

fections in a form adapted to personal application. It is not intended that the issue of the ointment in portable form should supplant prophylactic measures now in operation, but, on the contrary, should supplement them. In other words, the ointment is designated primarily for use by men who may not be in a position to avail themselves of existing opportunities for prophylaxis. Least of all is it intended that this authorization should result in any relaxation of effort in combating venereal disease along other lines.

4. The preparation will be listed on the Supply Table under the caption, "Hydrargyri chloridi mitis. Unguentum compositum (in collapsible containers)," and will be issued in quantities fixed by an allowance based on complement.

The complete item will be made up as follows:

- (a) Outer waxed-paper envelope.
- (b) "Directions for use," printed on thin waxed paper.
- (c) A collapsible container, holding 7.5 grams of calomel ointment, the orifice of the container being closed by a slip-on cap of soluble material.

E. R. STITT.

NOTES CONCERNING COMPOUND CALOMEL OINTMENT.

The preparation mentioned in Medicine and Surgery circular letter No. 158-1922 has the formula:

Calomel.....	33
Camphor.....	2
Phenol.....	3
Anhyd. lanolin.....	39
Benz. lard.....	20
Beeswax.....	3

The efficacy of 33 per cent calomel ointment in preventing luetic infection has been recognized since the publication of Metchnikoff's classic experiments in 1906. Less well known is the observation that an ointment of calomel and lanolin is, with the addition of certain ingredients, perhaps equally effective when applied intraurethrally in preventing Neisserian infections.

Much of the evidence in support of the assertion regarding the efficacy of the ointment in the prevention of infections of the mucosa is derived from published articles (1) and from the experience of several naval medical officers. Principal reliance, however, has not been placed on statistics, since all comparative statistics are influenced by so many unknown factors and by so many recognized factors that can not be evaluated, but on authenticated experimental observations. The bureau has knowledge of 45 individuals, known to have been inoculated with gonococci, all of whom escaped infection by means of prophylaxis administered within a short time. In each case calomel ointment was the prophylactic agent employed.

Regarding silver preparations, the bureau knows of no such conclusive evidence bearing on their prophylactic action, and furthermore considers that their physical characteristics unfit them for use in self-disinfection.

It is scarcely to be expected that by thus affording men opportunity to shorten the period elapsing between exposure and the application of prophylaxis there will result a "zero" incidence in the venereal disease rate. There will always be men who, for one reason or another, will neglect protective measures, and even among those recorded as having availed themselves of the

means afforded, absolute prevention of disease is unattainable—mainly for reasons such as—

- (a) Records erroneous as to fact or time.
- (b) Multiple coitus.
- (c) Recrudescence of existing disease.
- (d) Inefficient application of agents.
- (e) Ineffectiveness of agents employed.

Consequently the most that can reasonably be hoped for is the attainment of an incidence of 0.8 per cent among those who have taken prophylaxis, 0.8 per cent being the "probability" figure when the time element alone is considered.

The purpose in thus enumerating the several causes possibly operative in preventing the attainment of ideal results is to call attention to the limitations inherent in any method of self-disinfection and to the consequent obligation to continue active instruction in physiology and ethics.

- (a) Maus. Jour. Mil. Surg., 1910, XXVII, p. 264.
- (b) Maus. Jour. Mil. Surg., 1910, XXVII, p. 636.
- (c) Russell and Nichols. Jour. Mil. Surg., 1912, XXXI, p. 214.
- (d) Bachmann. Jour. Mil. Surg., XXXI, p. 192.
- (e) Personal communications.

Circular letter.

Serial No. 159—1922.

NLS: EGM 128014(21).

WASHINGTON, D. C., 1 February, 1922.

To: All medical officers, chief pharmacists, and pharmacists.

Subject: Discontinuance of use of certain paragraphs in manual for the Medical Department, 1917.

1. In advance of the publication of a revised manual for the Medical Department, the use of the following paragraphs in the 1917 manual for the Medical Department, U. S. Navy, relative to hospital corpsmen, will be discontinued:

483.	504 (c).	513.	522.
487.	511.	520.	523.
503.	512.	521.	524.

2. Reference to and use of the following paragraphs in the Bureau of Navigation Manual in place of those paragraphs mentioned above is directed:

D-4200.	D-4231.	D-4332.	D-4100 (b).	D-5710.
D-4210.	D-4232.	D-4341.	D-4102.	D-6401.
D-4220.	D-4233.	D-4380.	D-4106.	D-6417.
D-4221.	D-4234.	D-4383 (1) (2) (3) (4).	D-4121.	
D-4222.	D-4300.	D-5118 (1) (2).	D-4422 (a) (b) (c).	
D-4230.	D-4331.	D-5700.	D-4123.	

3. Prior to the issuance of a revised form N. M. S. H. C. 1 (Examination Report, Hospital Corps, U. S. Navy), it is directed that the name of the subject "Administration" (par. D-4383 (4) (L) Bunav. Manual) be placed at the top of one of the columns of subjects on each copy of this report forwarded to the bureau where this subject is a part of the examination.

E. R. STITT.

Circular letter.
Serial No. 160-1922.

WSG/T 129733(22).

WASHINGTON, D. C., *February 10, 1922.*

To: All naval hospitals.

Subject: Rehabilitation service: "Trainees"; naval hospital treatment of disabled soldiers, sailors, and marines while under training at navy yard and naval stations.

References: (a) Letter from Comdt. Mare Island to department, #30088-21-C. December 29, 1921.

(b) This bur's 2d end. on above to Assistant Secretary, #132680-D12 (12), January 26, 1922.

(c) Department's circular letter SONYD-1-Kr #6000-1121-67. February 1, 1922.

1. The above-mentioned circular letter (ref. c) is quoted as follows:

"1. The trainees of the Federal Board of Rehabilitation under an act of Congress approved August 9, 1921, became beneficiaries of the Veterans' Bureau. If, during training, they are injured or become sick, they are entitled to treatment by the Veterans' Bureau.

"2. Rehabilitation trainees under training by the Navy at navy yards, naval stations, etc., will be admitted to the nearest naval hospital upon the recommendation of the local district manager of the Veterans' Bureau. The Bureau of Medicine and Surgery will make all necessary arrangements and issue all necessary instructions relative to reimbursement by the Veterans' Bureau for such treatment in naval hospitals.

"3. Commandants of naval districts will transmit this letter to all organizations coming within their jurisdiction.

"4. Chiefs of bureaus and offices will transmit this letter to all inspection offices under their jurisdiction.

"5. The Major General Commandant, U. S. Marine Corps, will transmit this letter to all organizations of the U. S. Marine Corps not under the jurisdiction of naval officers.

(s) EDWIN DENBY.

2. In accordance with the order given in paragraph 2 of the above quoted letter, rehabilitation trainees under training by the Navy at navy yards and naval stations will be admitted to naval hospitals upon the recommendation of the local district manager of the Veterans' Bureau, if during training they shall be injured or shall become sick.

3. For the purpose of securing reimbursement from the Veterans' Bureau for treatment of trainees in naval hospitals, the quarterly report outlined in bureau's circular letter #129733(54) of October 22, 1920 (Serial No. 63-1920), will be followed with additional language in paragraph two thereof to indicate the number of "days of treatment" given trainees as follows:

"2. The above number of treatment days includes both the days of admission and the days of discharge, and includes ——— treatment days of trainees authorized by bureau's circular letter #129733(22) of February 10, 1922."

4. The directions given in bureau's circular letters #129733(54) of October 22, 1920 (Serial No. 63-1920), and No. 129733 of January 6, 1922 (Serial No. 154-1922), will be followed in all respects in the care, transportation, and burial of trainees, and especially as to telegraphic notifications and preparation of bills of lading.

E. R. STITT.

Circular letter.
Serial No. 161-1922.

NLS: EGM F-3-42022 124842(22).

WASHINGTON, D. C., February 6, 1922.

To: All medical officers, chief pharmacists, and pharmacists.

Subject: Preparation and forwarding of Form N.M.S.H.C. 3, Hospital Corps transfer and disposition card.

Reference: (a) Bureau of Medicine and Surgery circular letter, serial number 14-20 of 4 March, 1920.

(b) Paragraphs 6401 and 6417, Bureau of Navigation manual.

1. Paragraph 3 of reference (a) is hereby canceled.

2. The yellow Hospital Corps transfer and disposition card, fully filled out, will be forwarded direct to the Bureau of Medicine and Surgery, *immediately* upon the occurrence of any change in status or station of a Hospital Corps man as noted in the 23 separate cases shown on chart attached hereto.

3. Attention is called to the necessity of forwarding this form promptly in order that the bureau's records may show at all times the ship or station to which a man is attached and his status thereon thus permitting intelligent replies to be made to the numerous inquiries received. The accuracy of the entries on the individual jackets of the men concerned as well as the bureau's records depends entirely upon this form and the roster report of the Hospital Corps.

4. Carelessness in the preparation of this form is the cause of considerable trouble and unnecessary work. In preparing this form all data called for should be given, the surname must be spelled accurately, and the Christian name spelled in full.

E. R. STITT.

INSTRUCTIONS REGARDING FORWARDING OF YELLOW HOSPITAL CORPS TRANSFER AND DISPOSITION CARDS.

FORWARD ARRIVAL (RED-INK) HALF OF CARD, UPON:

1. Enlistment or enrollment.
2. Reenlistment or reenrollment.
3. Extension of enlistment.
4. Reporting from other ship or station, to include—
 - (a) Men received for further transfer.
 - (b) Men reporting for temporary duty.
 - (c) Men returning from temporary to permanent duty.
 - (d) Men admitted as patients for treatment.
 - (e) Men returning from unauthorized absence of five or more days, or desertion.
5. Reporting from change of rating (advancement in, reduction in, or change of rating).

FORWARD ARRIVAL (RED-INK) HALF OF CARD, UPON—continued.

6. Admission to sick list of member of crew (Hospital Corps man) (if for one week or more).
7. Reporting from sick list of member of crew (Hospital Corps man) if reported under subparagraph 6.
8. Placing of member of crew (Hospital Corps man) in confinement or awaiting trial.
9. Reporting of member of crew (Hospital Corps man) from confinement or awaiting trial.
10. Reporting from charge of civil or Federal authorities.
11. Return from leave of absence (five days or more).
12. Change in status or station of chief pharmacists and pharmacists.

FORWARD TRANSFER (BLACK-INK) HALF
OF CARD, UPON :

1. Discharge (termination of enlistment or enrollment for any reason and give character of discharge), death, unauthorized absence of five or more days, or desertion.
2. Extension of enlistment and give length of extension.
3. Transfer to other ship or station, to include—
 - (a) Men transferred for further transfer. In such cases indicate same, as, "Via R. S. ——— and U. S. S. ———."
 - (b) Men transferred for temporary duty.
 - (c) Men transferred from temporary to permanent duty.
 - (d) Men discharged as patients from treatment.
4. Change of rating (advancement in reduction in, or change of rating).

FORWARD TRANSFER (BLACK-INK) HALF
OF CARD, UPON—continued.

5. Admission to sick list of member of crew (Hospital Corps man) (if for one week or more).
6. Discharge from sick list of member of crew (Hospital Corps man) if reported under subparagraph 5.
7. Placing of member of crew (hospital corpsman) in confinement or awaiting trial.
8. Release of member of crew (Hospital Corps man) from confinement or awaiting trial.
9. Arrest by civil or Federal authorities.
10. Granting of leave of absence (five days or more).
11. Change in status or station of chief pharmacists and pharmacists.

Circular letter.
Serial No. 162-1922.

WRJ: THC 125884 (21).

WASHINGTON, D. C., 6 February, 1922.

To: All medical officers.

Subject: Charges made against the appropriation "Contingent, medicine and surgery, 1922."

Reference: (a) ALNAV No. six of February 3, 1922.

1. The bureau notes, from an examination of the reports of expenditures, that ships and stations are drawing supplies from the supply officer that should be drawn from the medical supply depot exclusively. The limited amount available under the appropriation "Contingent, medicine and surgery" will not last the balance of the present fiscal year unless these unauthorized expenditures are discontinued.

2. It is directed that no charges be made by ships and stations against the appropriation "Contingent, medicine and surgery," except on approved requisitions or allotments, or upon the occurrence of an unusual emergency.

3. Until the issue of the new supply table, alcohol may be secured through the supply officer as a charge against the appropriation "Medical department."

4. Cleaning material used in the medical department of ships is not a proper charge to medical department appropriations; material should be secured from the "first lieutenant"; the practice of obtaining these supplies from the supply officer on stub requisitions will be discontinued. This does not apply to cleaning material used exclusively by the medical department of hospital ships, which are designated by Navy Regulations as "floating hospitals."

5. The bureau is confronted with a deficiency under "Contingent, medicine and surgery," unless a radical reduction is made in expenditures.

E. R. STITT.

Circular letter.
Serial No. 163-1922.

WRJ: THC 125884 (22).

WASHINGTON, D. C., 11 February, 1922.

To: All medical officers.

Subject: Budget and accounting system.

References: (a) Section 3, article 396, Navy Regulations.

(b) Bureau's circular letter No. 132883 (62) of July 25, 1921.

(c) Bureau's circular letter No. 125884 (83) of August 13, 1921.
(Hospitals only.)

(d) Bureau's circular letter No. 125884 (113) of November 17, 1921.
(Hospitals only.)

(e) Bureau's circular letter No. 125884 (124) of December 29, 1921.
(Hospitals only.)

Inclosures: (2).

1. The reports required by references (b), (c), and (e) will be discontinued after the reports for the fiscal year 1922 have been submitted. This letter supersedes reference (d) with the exception of the directions relating to the submission of requests for job orders. (Paragraph 3, subparagraphs (o) to (ff), inclusive.)

2. Reference (a) directs that amounts of appropriations be so apportioned by monthly or other allotments as to prevent expenditures in one portion of the year which may necessitate deficiency or additional appropriations to complete the services of the fiscal year for which said appropriations are made.

3. In order that this bureau may lay out in advance a program of expenditures, and know the extent to which the actual expenditures and obligations correspond with such program, the system hereinafter described is established.

4. The purpose of the system is to enable the Surgeon General, as the responsible head of the administration of the Bureau of Medicine and Surgery, to present to the Secretary of the Navy an annual business program which shall contain the necessary information concerning the financial requirements of all the activities under the cognizance of this bureau, in such form as clearly to indicate the application of business principles to the bureau's administrative activities.

5. A uniform system of accounts is essential to the intelligent preparation of a business program. The records of the detailed apportionments and expenditures of money should be kept in accordance with some uniform classification in order that (1) the requirements of the different activities may be fully and readily compared; (2) statements of expenditures for the same objects may be stated in identical language, thus facilitating easy, rapid, and intelligent examination and control; (3) to furnish a basis for the estimates, the appropriation acts, the reporting of financial data—all upon a uniform system; and (4) to enable a sufficiently concrete picture of the total financial operations of the bureau to be assembled in a reasonable compass.

6. To provide a uniform system of accounts it is necessary that a uniform standardized classification for use in all Medical Department activities be established. The essential elements of such classification fall into five groups:

- (1) Activity.
- (2) Type of activity.
- (3) Character of expenditure.
- (4) Object of expenditure.
- (5) Appropriation.

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7. The first four of the above classifications bear a progressive relationship to each other—that is, total expenditures of activities would be divided according to type of activity; the expenditures according to type of activity would be divided according to character; and the expenditures according to character would be divided according to object. The fifth classification, by appropriation from which the expenditures are made, would be shown separately in the nature of a recapitulation and the expenditures from each appropriation classified by activity, type, and character.

8. The classification by activity refers to the setting up of all records and accounts separately for each activity; classification by type of activity involves a subdivision of the classification by activity with reference to the Navy nomenclature, i. e., hospitals, ships, and stations; classification by character of expenditures involves a distinction between expenditures for the different classes of supplies and services; and classification by objects of expenditures involves a distinction referring particularly to the class of object or services purchased.

9. The classification by character of expenditures involves the following headings:

- (1) Administrative expenses.
- (2) Maintenance and operating expenses:
 - (a) Equipment.
 - (b) Supplies.
 - (c) Repairs.
 - (d) Labor.
 - (e) Indeterminate.
- (3) Plant (first cost).
- (4) Expenses chargeable to the Navy as a whole.
- (5) Purchase of stock for general issue.

Administrative expenses refers only to the pay of the clerical force; maintenance and operating expenses refers to all expenditures for the operation, repair, upkeep, and replacements necessary for the maintenance of the activity, except such expenditures as could be charged to plant, first cost, which include every expenditure that is a direct charge against new construction; expenses chargeable to the Navy as a whole refers to expenditures that could not be charged to any one activity, such as care of the dead, care of the insane, etc.; purchase of stock for general issue refers to expenditures made by the supply depots for general issue to the service as a whole.

10. The classification by objects would involve the following headings:

- (1) Surgeon's necessities.
 - (a) Medicines.
 - (b) Surgical instruments and appliances.
 - (c) X ray.
 - (d) Laboratory.
 - (e) Physiotherapy.
 - (f) Operating room, ward, and sick room equipment.
 - (g) Special diets.
- (2) Civil establishment.
 - (a) Transportation.
 - (b) Power house.
 - (c) Commissary.
 - (d) Laundry.
 - (e) Buildings and grounds.
 - (f) Clerical.
 - (g) Technical.

- (3) Service utilities.
 - (a) Gas.
 - (b) Water.
 - (c) Electricity.
 - (d) Steam.
 - (e) Fuel.
 - (f) Power plant.
 - (g) Refrigerating plant.
- (4) Buildings and grounds.
 - (a) Buildings.
 - (b) Grounds.
 - (c) Furniture.
- (5) Commissary.
 - (a) Subsistence.
 - (b) Culinary and mess gear.
- (6) Laundry.
- (7) Transportation service.
 - (a) Nonpassenger-carrying vehicles.
 - (b) Passenger-carrying vehicles.
 - (c) Feed for animals.
- (8) Care of sick on detached duty.
 - (a) Treatment in other than naval hospitals.
 - (b) Professional services.
- (9) Dental.
 - (a) Material.
 - (b) Services.
- (10) Care of insane.
- (11) Care of dead.
 - (a) Preparation.
 - (b) Clothing.
 - (c) Coffins.
 - (d) Transportation.
 - (e) Care of cemeteries.
- (12) Books, stationery, and printing.
 - (a) Books.
 - (b) Stationery.
 - (c) Miscellaneous printing.
 - (d) Printing medical bulletin.
- (13) Instruction and investigation.
 - (a) Hygienic and sanitary investigation.
 - (b) Sanitary, hygienic, and special instruction.

11. After July 1, 1922, no obligation will be made against any appropriation under the cognizance of the Bureau of Medicine and Surgery without prior approval, except upon the occurrence of some extraordinary emergency or unusual circumstance. In realization of the fact that an extraordinary emergency may arise or unusual circumstance occur in relation to the care of the sick or preservation of property that could not be anticipated, it is not the intent or policy of this bureau to establish an absolute order that would in any way prohibit the procurement of services or supplies immediately necessary for the care and welfare of the sick and for funeral expenses.

12. Estimated expenditures for the fiscal year 1923, under each appropriation, accompanied by annual requisitions and statements showing, in such detail and form as may be necessary to inform the bureau, the manner of

expenditures of such estimates, will be transmitted, by every medical department activity, so as to reach the bureau not later than March 15, 1922. The sample form submitted herewith and the procedure outlined may be modified, if necessary, to meet special conditions of each activity arising in the preparation of the estimates, the purpose being to standardize as far as possible in condensed form the tables relating to estimates.

13. In the preparation of the above estimates the fact must be borne in mind that the appropriations for the fiscal year 1923 will certainly be less than for the current year and the need for economy and retrenchment will be greater than ever before.

14. Beginning with the fiscal year 1923 an allotment card will be prepared in the bureau and forwarded to the activity concerned for every requisition or request approved. This card will show the appropriation to which chargeable; the character of expenditure; the object of expenditure; and the amount that may be expended in a specified time. The amount shown as a monthly or quarterly allotment is not cumulative; will not be exceeded, except for provisions, coal, gas, water, and electricity, or as provided for in paragraph 11; and any saving for the specified period reverts to the bureau for future apportionment.

15. Using the allotment card as a guide, each activity will, at the end of each month, complete and submit a report card for each allotment.

(a) A report card will be submitted at the end of each month irrespective of the specified period of allotment. Savings will be reported on the card covering the expenditures for the last month of the specified period of allotment. For example, in the case of a quarterly allotment the report card for the first two months would only show actual expenditures. The card for the last month of the quarter would show the saving.

(b) Should the expenditure be made as provided for in paragraph 11, the report card will state the circumstances compelling such action. When the card is received in the bureau an allotment card will be prepared and forwarded to complete the files.

(c) In the case of supply depot requisitions, for which no allotment is made, the report will show under "Remarks" the classifications and amounts as shown on the back of "Form B."

(d) When a requisition or apportionment is completed, or when for a specified period all obligations are satisfied, the report will show the difference between the estimated and actual cost as a saving.

(f) In entering the type of services or supplies, use definite terms. If more than one type of services or supplies are included, state under "Remarks" the amount of each type.

(g) Only the actual amounts paid civil employees will be reported as an expenditure.

16. Due to the delay incident to having the "report cards" printed, it is not expected that they will be ready for issue before June 1, 1922. Requests for a supply of these cards will be made to the Medical Supply Depots direct.

E. R. STITT.

(Inclosure.)

WRJ:THC 125884(22).
FEBRUARY 11, 1922.

RELATING TO THE SUBMISSION OF ESTIMATES.

1. Estimates will be based on the least possible amount that will be required for the operation and maintenance of the activity.

2. Possible emergencies will not be considered for the reason that should emergencies be included in the estimates the limited appropriations of the bureau would be overobligated. The bureau will, in the case of an emergency, authorize an increase in the amount of any allotment.

3. No estimates will be made for supplies to be requisitioned from medical supply depots.

4. Open purchase requisitions will not be submitted for supplies that may be secured from the supply officer, medical supply depots, or on local provision contract.

5. A "Request for allotment card" will be prepared to cover each object of expenditure not covered by open purchase requisition. This card, together with the open purchase requisitions, will give a complete and comprehensive statement as to the requirements of the activity, enabling the bureau to make reductions along comprehensive lines should the amount requested exceed the funds available.

6. To illustrate how the card should be prepared the following example is given.

An allotment is required to secure gasoline and oils for the ambulance service: Under classification by character of expenditures it is found that heading No. 2, Maintenance and operation, subhead (b); under object of expenditure heading No. 7, Transportation service, subhead (a), would apply and the form would be prepared as follows:

REQUEST FOR ALLOTMENT.

Place: U. S. Naval Hospital, Washington, D. C.

Subtitle of appropriation: Contingent, M. & S.

Character: (2) Maintenance and operation.

Subhead: (b) Supplies.

Object: (7) Transportation service.

Subhead: (a) Nonpassenger-carrying vehicles.

Estimated cost: \$1,000; period, fiscal year.

Description, reason, references, remarks, etc.

To cover gasoline and oils on stub requisitions.

NOTE.—Open purchase requisition submitted to cover purchase of tires and spare parts.

7. In addition to the above a summary sheet will be prepared showing the amount requested under each appropriation.

REQUEST FOR ALLOTMENT CARD.

Place _____
 Subtitle of appropriation _____
 Character _____
 Subhead _____
 Object _____
 Subhead _____
 Estimated cost _____ Period _____
 Description, reason, reference, remarks, etc.

SAMPLE ALLOTMENT CARD.

Allotment No. 2815-1.

AUTHORITY FOR EXPENDITURE, BUREAU OF MEDICINE AND SURGERY.

Place: Naval Hospital, Washington, D. C.
Subtitle of appropriation: Naval hospital fund.
Character: (2) Maintenance and operation.
Subhead: (b) Supplies.
Object: (3) Service utilities.
Subhead: (e) Fuel.
Estimated cost: \$5,000. Semiannual allotment: \$2,500.
Allotment expires: June 30, 1922.
Description, reason, reference, remarks, etc.
Coal to be obtained from local supply officer.
Hauling charges to be included in cost of fuel.
Payment to be made by stub requisition.
Approved: June 30, 1921. By: Chief of Bureau.

SAMPLE REPORT CARD.

Allotment No. 2815-1. Report No. 6.

EXPENDITURES FOR MONTH OF DECEMBER, 1921.

Place: Naval Hospital, Washington, D. C.
Subtitle of appropriation: Naval hospital fund.
Character: (2) Maintenance and operation.
Subhead: (b) Supplies.
Object: (3) Service utilities.
Subhead: (e) Fuel.
Estimated cost: \$5,000. Semiannual allotment: \$2,500.
Completed (yes or no): Semiannual allotment completed.
Expenditures for month: \$800. Total to date: \$2,000.
Actual cost: ———. Saving: \$500.
Type of services or supplies: Coal.
General remarks: None.
NOTE.—For the first five months no saving would be reported, as the period of allotment is six months. Actual cost will not be entered until all obligations are satisfied.

Circular letter.
Serial No. 164-1922.

WSD/JBC 124942-O.

WASHINGTON, D. C., *February 13, 1922.*

To: All naval hospitals (continental limits); naval hospital, Pearl Harbor, T. H.; naval medical school, Washington, D. C.; sick quarters, marine barracks, Quantico, Va.

Subject: Civilian employees; computation of monthly pay.

Reference: M. & S. circular letter, Serial No. 155-1922, No. 124942-O, January 6, 1922, par. 2.

1. Under separate cover, the bureau is forwarding a copy of the "Government salary tables (third edition)," for use in computing the monthly pay of civilian employees. This edition will be of particular help in connection with the pay of excepted employees, as extensions are given covering nearly all rates of pay.

E. R. STITT.

N-5/F/McL 5511-379.

NAVY DEPARTMENT, BUREAU OF NAVIGATION,
Washington, D. C., 27 December, 1921.

Bureau of Navigation Circular Letter No. 43-21.

To: All ships and stations.

1. In reviewing the proceedings of the courts of inquiry and boards of investigation convened to inquire into the circumstances attending the deaths of Anton Huhn, late seaman, second class, U. S. Navy, and John J. Morrill, late seaman, second class, U. S. Navy, on the U. S. S. *Huron*, and of William Sabon, late seaman, first class, U. S. Navy, on board the U. S. S. *Hopkins*, the bureau notes that in each case death was the result of asphyxiation while working in an insufficiently ventilated compartment.

2. The accident on the *Huron*, which occurred in a hold of that vessel in which flour was stored, discloses the fact that carbon dioxide is generated from stored wheat and its products. While the figures showing the exact amount of carbon dioxide generated are not available, the quantity is generally considered small and negligible where the flour is stored in a manner permitting free ventilation; in the absence of ventilation, however, carbon dioxide will accumulate and vitiate the air of a storeroom to a considerable extent, particularly in cases where the amount of unoccupied space in the room is small. The quantity of carbon dioxide thus developed is usually greatly increased if the flour contains a relatively large amount of moisture or if infested with insects, but it may appear in the presence of apparently good flour.

3. The death on board the U. S. S. *Hopkins* occurred in the chain locker of that vessel during the process of tiering the anchor chain. A coat of black boot topping was being applied to the chain on deck, and the men were working in shifts tiering it as it came below. Since the testimony indicates that all usual precautions had been taken to assure the proper ventilation of this compartment, and an accident nevertheless occurred, it seems quite apparent that ordinary precautions are not always adequate to insure safety.

4. The above information is promulgated to the service in order to emphasize the necessity of utilizing every available means properly to ventilate below-deck compartments prior to the entry of personnel, and all commanding officers are therefore directed to take appropriate steps on board the vessels under their command to prevent future accidents of this nature.

PHILIP WILLIAMS, *Acting*.

26504-444 D-M1.

27 JANUARY, 1922.

Navy Department circular letter No. 1-22.

Subject: Changes in naval courts and boards, 1917.

1. The following changes in naval courts and boards, 1917, approved 10 January, 1922, takes effect immediately:

Strike out paragraph 673, page 453, variation 5, Naval courts and boards, and substitute the following:

"Var. 5. We hereby certify that should the above mentioned defect—namely, 2 pounds under standard weight and 1 inch under standard chest circumference be waived, which action is (not) recommended by the board, ———, M. D., is physically qualified for admission to the United States Navy as an assistant surgeon in the Medical Reserve Corps and recommend him for appointment."

/s/

EDWIN DENBY.

N14-PR-GLD 55408-350.

NAVY DEPARTMENT, BUREAU OF NAVIGATION,
Washington, D. C., 27 January, 1922.

Bureau of Navigation circular letter No. 7-22.

To: All ships and stations.

Subject: Social hygiene activities of Bureau of Navigation transferred to
Bureau of Medicine and Surgery.

1. The social hygiene section of the morale division of the Bureau of Navigation has this date been transferred to the division of preventive medicine of the Bureau of Medicine and Surgery.

2. All correspondence relating to social hygiene will hereafter be addressed to the Bureau of Medicine and Surgery.

/s/ THOMAS WASHINGTON.

In reply refer to:
RWB/emp 10
Hospital Section.

Bu. M&S. 9 Feb. 1922. 129733(21).
TREASURY DEPARTMENT,
BUREAU OF WAR RISK INSURANCE,
Washington, February 3, 1922.

The SURGEON GENERAL,
U. S. Navy, Washington, D. C.

SIR: The following letter is this date being sent to all our district managers. It is requested you notify the various hospitals under your control that care for patients of this bureau of its contents.

"The following question has recently been submitted to the central office for decision and ruling:

"'It is requested that the central office give us a ruling as to whether or not claimants and beneficiaries of the U. S. Veterans' Bureau who are hospitalized because of an order from this bureau, who refuse to accept spinal punctures for diagnostic purposes, or obstruct in any other way procedures which are considered necessary by the hospital authorities for the purpose of making diagnosis or rendering treatment, are allowed transportation to their homes or to the point from which they were sent to the hospital under order of the district manager.'

"Patients discharged from hospital, if discharged in the regular way for completion of treatment, do not come under General Order #27-A, and are entitled to transportation and necessary expenses as outlined in U. S. V. B. Regulation #16 (January 14, 1922); B. W. R. I. Field Order #20 (July 10, 1921); General Order #26, U. S. V. B. (September 6, 1921).

"Under General Order #27-A, patients discharged against medical advice receive transportation expenses as outlined above for their first discharge. On any subsequent discharge against medical advice they are not entitled to transportation or other expenses as outlined above. This same statement applies to patients discharged for disciplinary reasons. Unless a patient is discharged for the second time against medical advice, or for the second time for disciplinary reasons, he is entitled to transportation and other expenses to his home or to the point from which hospitalized, as outlined above.

"However, patients who refuse to accept spinal puncture for diagnostic purpose or obstruct in any other way the procedures which are considered necessary by the hospital authorities for the purpose of making diagnosis or rendering treatment should be examined by a board of medical officers at the hospital, and the recommendations of the board, if approved by the medical

officer in charge of the hospital, should be forwarded to the central office for final action.

"This board of medical officers should be cognizant of and consult section 303 of the war risk insurance act. A patient so obstructing or refusing treatment distinctly comes under section 303 of the war risk insurance act, and the penalty for such obstruction is clearly outlined in this section.

"For your information there is inclosed a copy of hospital division similar letter #154, dated January 14, 1922, issued by the U. S. Public Health Service."

Yours very truly,

C. R. FORBES,
Director U. S. Veterans' Bureau.

Encl.

L-795.

PROCEDURE PRESCRIBED BY THE U. S. VETERANS' BUREAU FOR PATIENTS REFUSING
TREATMENT.

TREASURY DEPARTMENT,
BUREAU OF THE PUBLIC HEALTH SERVICE,
Washington, January 14, 1922.

HOSPITAL DIVISION SIMILAR LETTER No. 154.

To medical officers in charge of U. S. Public Health Service and Marine Hospitals:

For your information and guidance there is quoted below a letter under date of December 8, 1921, from the Director U. S. Veterans' Bureau, which sets forth clearly the procedure recommended in cases where treatment is refused, particularly operations:

"U. S. VETERANS' BUREAU,
"HOSPITAL SECTION,
"Washington, D. C., December 8, 1921.

"SURGEON GENERAL,
"U. S. Public Health Service,
"Washington, D. C.

"DEAR SIR: Your letter dated November 30, 1921, in which you quote the following extract from a letter from the executive officer in charge of one of your hospitals—

"What shall be our procedure with regard to patients who refuse to accept the treatment recommended by us and who do not request their discharge from the hospital contrary to medical advice?

"We wish this point to be cleared up, particularly with regard to patients where operation is recommended. We have a class of patients in which it is clear that the only treatment indicated is an operation, which operation the patient refuses to undergo and at the same time desires to continue his stay in the hospital.

"Are these men to be brought before the disciplinary board and treated as though they had committed a breach of discipline or can they be discharged through a board of survey as not in need of any treatment except operation, which is refused by them?

" 'Any light you can give us on these points will be of great assistance to us in disposing of these cases.'

" is answered as follows:

" A patient of this bureau who refuses to accept treatment recommended by the medical officers in charge of his case should be examined by a board of medical officers, and the recommendations of this board, if approved by the medical officer in charge of the hospital, should be forwarded to this bureau for final action.

" This board of medical officers should be cognizant of and consult section 303 of the war risk insurance act. In general, this bureau believes that patients who refuse operation, where it is clear that the only treatment indicated is operation, should be recommended for discharge from the hospital.

" If a patient refuses an advised major operation, and, in spite of the fact that no operation is performed, still needs hospital treatment, he should be retained in the hospital for treatment. A case of this sort particularly comes under the last sentence of section 303 of the act referred to above, which reads:

" 'and the consequences of unreasonable refusal to submit to any such treatment shall not be deemed to result from the injury compensated for.'

" Such a patient should be carefully examined by a board of officers and their approved findings forwarded to this office for reference to our compensation section.

" It is desired by this office in all cases of this, or of a similar nature, that the specific case and facts, together with the recommendations of the responsible commanding officer, be forwarded to this bureau for a specific decision.

" Yours very truly,

"(Sgd.) C. R. FORBES,
"Director, U. S. Veterans' Bureau."

It is directed that medical officers forming the boards indicated acquaint themselves with section 303 of the war risk insurance act as noted above.

Reports submitted pursuant to these instructions, must, of course, be forwarded to the District Manager, U. S. Veterans' Bureau, for transmission to the central office of the U. S. Veterans' Bureau at Washington, D. C.

Respectfully,

H. S. CUMMING, *Surgeon General.*

JRM/eh

Circular letter.
Serial No. 165-1922.

WSD/JBC 124942-O
132687-O

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 16, 1922.

To: All naval hospitals (continental United States).

Subject: Urgent repairs to buildings, walks, and roadways.

Reference: (a) Paragraph 3, bureau's circular letter, serial No. 94-1921, No. 124942-O(33), April 26, 1921.

(b) Dept. #28577-188, SONYD-O-MJC, February 8, 1922, transmitting copy of President's letter of January 26, 1922.

1. Prior to the end of the current fiscal year, the bureau desires that the hospitals shall undertake such minor repairs, including painting, as may be necessary for actual preservation of property and to maintain the buildings in fit condition to receive patients during the fiscal year 1923; urgent work on the grounds and repairs to walks and roadways will also receive attention. The

painting should include exterior work required on temporary buildings for purposes of preservation rather than for appearances, and reconditioning of hospital furniture. Iron beds and other metal furniture should be repainted instead of being sent to the yard for lacquering.

2. To accomplish this work, the bureau, upon request of the hospital, will authorize the temporary employment of additional workmen (carpenters, painters, plumbers, etc.) until June 30, 1922; employees, when authorized, to be secured through the labor board.

3. It is directed that an estimate be submitted, by separate items, in order of importance, of the work deemed necessary (limited strictly to minor repairs as stated above) to maintain the hospitals in fair condition for another year, specifying:

- (a) The nature and scope of the work proposed;
- (b) The number of workmen in each rating required, with estimate of their total pay for the period they will be employed;
- (c) The cost of the material which will be required, and whether obtainable from naval stores;
- (d) The cost of any other incidental items of expenditure.

4. The material referred to in paragraph 3 (c) hereof will be a charge against "Naval hospital fund"; the employees will be carried on the hospital pay rolls, and will be a charge against the appropriation "Medical Department, 1922."

5. All work recommended must be of a character that can be completed by June 30, 1922.

6. Please expedite reply.

E. R. STITT.

Circular letter.
Serial No. 166-1922.

WJCA: ESK 129733(21).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 16 February, 1922.

To: All naval hospitals.

Subject: Action to be taken with Veterans' Bureau patients who refuse spinal punctures, etc., necessary in diagnosis and treatment.

References: (a) Director, U. S. Veterans' Bureau letter to Surgeon General, U. S. Navy, RWB/emp 10 Hospital Section, Feb. 3, 1922.
(b) Surgeon General, U. S. Public Health Service circular letter No. 154 of Jan. 14, 1922.

Enclosures: (2).

1. References (a) and (b), regarding procedure prescribed by the U. S. Veterans' Bureau for patients refusing treatment, are forwarded for your information.

E. R. STITT.

Circular letter.
Serial No. 167-1922.

JTB: ESK 129733(23).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 25 February, 1922.

To: All naval hospitals.

Subject: Veterans' Bureau patients for whom domiciliary care is necessary.

References: Letter of Director, U. S. Veterans' Bureau RWB/jat: 10-Hospital Section of February 18, 1922.

1. For your information there is quoted herewith the contents of a letter from the Director of the U. S. Veterans' Bureau under date of February 18, 1922 (RWB/jat: 10).

"It is requested that the medical officers in charge of the hospitals under your jurisdiction be advised that any patient whose physical condition is such as to require relatively little in the nature of medical care and treatment, but for whom domiciliary care is necessary, should be transferred to an appropriate soldiers' home.

"All such patients should, on the initiative of the medical officer in charge, be brought to the attention of the district manager, with a recommendation that such transfer be effected."

E. R. STITT.

Circular letter.
Serial No. 168-1922.

WSD/JBC 124677-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., March 9, 1922.

To: All naval hospitals (continental limits).

Subject: Information for next of kin regarding expenses in connection with the preparation, encasement, and transportation of the remains of the dead.

Enclosure: One pad of N. M. S. Hospital Form No. 61.

1. The enclosed form to be used in informing the next of kin regarding transportation of remains, etc., has been revised to meet the changes in the law governing payment of burial expenses by the U. S. Veterans' Bureau, contained in the act of August 9, 1921, establishing the Veterans' Bureau, as follows:

"SEC. 22. A new section is hereby added to Article III of the war risk insurance act, to be known as section 315, and to read as follows:

"SEC. 315. That no person admitted into the military or naval forces of the United States after six months from the passage of this amendatory act shall be entitled to the compensation or any other benefits or privileges provided under the provisions of Article III of the war risk insurance act as amended."

2. It is directed that copies of the old form, "Information for next of kin," be destroyed, and that the enclosed form be used hereafter.

3. Additional copies of N. M. S. Hospital Form No. 61 can be obtained from the Naval Medical Supply Depot, Brooklyn, New York.

E. R. STITT.

Circular letter.
Serial No. 169-1922.

JWR-AL 126963(92).

WASHINGTON, D. C., *March 16, 1923.*

To: All medical officers (via commanding officers).

Subject: Officers and men sick on detached duty or leave.

References: (a) Bu. M. & S. circular letter #126963(92) of December 9, 1919, to all medical officers.

(b) Bu. Nav. circular letter #128-19 of September 15, 1919, to all ships and stations.

(c) Article 1189, Navy Regulations, 1920.

In order that the medical history of each member of the Navy may be complete and to enable the Bureau of Medicine and Surgery to determine whether or not certain bills for medical treatment are proper charges against the Government, it is directed that medical officers having cognizance of the illness of

an officer or enlisted man while on detached duty or leave of absence shall report the matter promptly to the Bureau of Medicine and Surgery.

This circular letter is a revision of and supersedes above-mentioned circular letter of this bureau (Ref. a), your file copy of which should be marked "obsolete" and reference made thereon to this letter.

The following items of specific information are desired by the bureau and the report should be made in the order indicated.

Name _____.

Rate _____.

Station _____.

Diagnosis (from nomenclature) _____.

Origin (duty or not; misconduct or not) _____.

Circumstance attending incurrence _____.

Disposition (include date taken ill or injured) _____.

Was he in a duty status, or performing duty at the time? _____.

Was he on liberty or leave (if on liberty, state exact period for which granted and dates from and to) ? _____.

Were the services necessary and authorized (and by whose authority)? _____.

Were the services of a naval medical officer or a naval hospital available? _____.

Remarks _____.

E. R. STITT.

Circular letter.

WJCA : ESK 129733(32).

Serial No. 170-1922.

WASHINGTON, D. C., 20 March 1920.

To: All naval hospitals.

Subject: Veterans' Bureau claimants, sentenced to loss of compensation for disciplinary reasons under General Order No. 27-A.

Reference: Letter from Director, U. S. Veterans' Bureau REH/eus: 10-Hospital Section, of March 13, 1922.

1. For your information there is quoted herewith the contents of a letter from the Director of the U. S. Veterans' Bureau under date of March 13, 1922 (REH/eus: 10):

"In order that there shall be on record at each hospital a definite statement from Veterans' Bureau claimants, sentenced to loss of compensation for disciplinary reasons under General Order No. 27-A, regarding their wishes in the matter of an appeal to the district board of discipline and morale, as laid down in section 6, paragraph 2, and section 8, paragraph 1 (a), of General Order No. 27-A, it is suggested that the commanding officers of hospitals under your jurisdiction treating Veterans' Bureau patients be requested to prepare printed or typewritten forms containing the following statement for the claimant's signature:

"_____ Hospital.

"Date _____.

"Having been notified of the approval by the commanding officer of the findings of a disciplinary board in my case, which includes loss in compensation of _____ per cent and of my right to appeal to the board of discipline and morale at district headquarters, I hereby state that I do (do not) wish to exercise my right to make such appeal.

"This form should be executed by the claimant when notified of the approval of the findings of the disciplinary board by the commanding officer of the hospital."

E. R. STITT.

Circular letter.
Serial No. 171-1922.

WJCA:ESK 129733 (33)

WASHINGTON, 27 March, 1922.

To : All naval hospitals.

Subject: Re discharge from hospitals of Veterans' Bureau patients for disciplinary reasons.

Reference: Letter from Director, U. S. Veterans' Bureau REH/eus: 10 Hospital Section of March 21, 1922.

1. For your information there is quoted herewith the contents of a letter from the Director of the U. S. Veterans' Bureau under date of March 21, 1922 (REH/eus: 10):

"Requests for authority to rehospitalize beneficiaries discharged from hospitals for disciplinary reasons under U. S. Veterans' Bureau General Order No. 27-A have become so numerous as to warrant the conclusion that the physical condition of these claimants at the time of trial is not given sufficient consideration. This is especially true concerning the patients discharged from tuberculosis hospitals.

"In order to make clearer certain provisions of General Order No. 27-A and correct misunderstandings concerning certain of its provisions, the following instructions have been prepared, and it is requested that they be sent to the commanding officers of the institutions under your jurisdiction for their information.

"1. In general, no patient whose physical condition is such at the time of trial as to clearly indicate the imperative need of hospital treatment should be recommended for disciplinary discharge. Reduction of compensation as authorized in Section VIII, paragraph 1, of General Order No. 27-A is the proper penalty under these circumstances. For offenses of a flagrant nature for which reduction of compensation alone is not considered a sufficient punishment, confinement to disciplinary ward and withholding of all special privileges, in addition to loss of compensation, would be justified. In all cases where a discharge from hospital for disciplinary reasons is recommended, the board should state on Form 1874, under "Recommendation," that such discharge would not, in the board's opinion, be detrimental to patient's health.

"2. In recommending loss of compensation in accordance with Section VIII, General Order No. 27-A, disciplinary boards should specify the *per cent only* of reduction for a period of months and not the actual amount to be forfeited.

"3. The disciplinary board should inform the claimant at the time of trial of his right to appeal the recommendation of the board to the district board of discipline and morale, provided this recommendation is approved by the medical officer in charge. A statement as to the desire of the claimant in this matter should be obtained at the time of the trial.

"There is being added to Form 1874 a space for notation that claimant was notified of his right to appeal and also that he did or did not desire to so appeal from the recommendation of the board.

"4. In case a beneficiary is tried by a board of officers as provided in Section VI, paragraph 4, General Order No. 27-A, and is awarded a minor punishment *not involving discharge or loss of compensation*, this award should take effect on the approval of the findings by the medical officer in charge of the hospital, and the preparation and forwarding to the central office of Medical Division Form 1874 is not necessary.

"5. In the case of a claimant who has been discharged for disciplinary reasons requesting rehospitalization before the three months' period, as specified in paragraph 2, General Order No. 27-A, has elapsed, it must be clearly shown from a physical examination that such immediate readmission is absolutely necessary for the patient's welfare or that compliance with the above provision of this order would result in lessening the claimant's chances of ultimate recovery or aggravating his disability."

E. R. STITT.

Circular letter.
Serial No. 172-1922.

WRJ:THC 125884 (34).

WASHINGTON, D. C.,
28 March, 1922.

To: All medical officers.

Subject: Surgical instruments, X ray and laboratory supplies.

1. After July 1, 1922, requisitions for surgical instruments, X ray and laboratory supplies, except laboratory animals, will be made on Requisition Form 4, and submitted to the bureau for approval.

2. Laboratory animals will be purchased on approved open purchase requisitions.

3. Annual requisitions for the fiscal year 1923, covering the above-mentioned supplies, except laboratory animals, will be returned unapproved.

4. Activities equipped with X ray outfit and operating laboratories will submit immediately an estimate to the Bureau of Medicine and Surgery for supplies required for these departments for the fiscal year 1923. Estimates will be specific as to the articles required, the quantity, size, etc., of each item and will be submitted with due regard to economy.

5. All requisitions for surgical instruments shall be submitted to the bureau for approval.

E. R. STITT.

Circular letter.
Serial No. 173-1922.

WSG/T 132680-0 (122).

WASHINGTON, D. C.,
April 13, 1922.

To: Medical officers of navy yards and naval stations, via commandant.

Subject: Charges for furnishing steam, coal, and electric light at dispensaries.

References: (a) This Bur's. 4th end. #132680 D1 (92), September 21, 1921.

(b) This Bur's. letter #132680-0 (122), December 9, 1921.

(c) S. & A.'s 6th end. #122-37/122-5, October 10, 1921.

(d) S. & A.'s 1st end. #122-37/122-5, March 15, 1922.

(e) Y. & D.'s 7th end. #741-1, October 13, 1921.

(f) Y. & D.'s 2nd end. #710-1, March 20, 1922.

1. The Bureau of Supplies and Accounts holds—

(Ref. c.) "Existing instructions do not require that steam used in dispensaries at industrial navy yards be charged directly against maintenance appropriations. It is probable that at some yards charges of this character are prorated to appropriations as a part of the general yard indeterminate charges."

(Ref. d.) "It is believed that no charges should be made to appropriations under the cognizance of the Bureau of Medicine and Surgery on account of coal and electric light furnished to yard dispensaries. This opinion is also in accordance with the recommendation of the board on cost accounting and approved by the Secretary of the Navy that all charges for power at industrial

yards be made to 'Maintenance, yards and docks,' or to 'indeterminate expense.' "

2. The Bureau of Yards and Docks states—

(Ref. e.) "Dispensaries are a part of the military establishments of navy yards and stations, and the cost of steam for use in the buildings is considered as a charge against yard maintenance appropriations."

(Ref. f.) "This Bureau is of opinion that coal and electric current furnished to yard dispensaries is a proper charge against 'Maintenance, yards and docks,' except that at industrial yards they may be charged to 'Indeterminate expense.' "

3. In accordance with the foregoing, charges for steam, coal, and electric current furnished dispensaries at navy yards and stations will *not* be made a charge against any appropriation under the cognizance of the Bureau of Medicine and Surgery.

E. R. STITT.

Circular letter.
Serial No. 174-1922.

WJCA:ESK 124680 (41).

WASHINGTON, D. C.,
14 April, 1922.

To: All naval hospitals.

Subject: Certificates of illness for insurance and fraternal compensations for Veterans' Bureau patients in U. S. naval hospitals.

Reference: Letter from director, U. S. Veterans' Bureau, dated April 8, 1922.

1. The commanding officers of several United States naval hospitals have received requests from Veterans' Bureau patients for certificates of illness for insurance and fraternal compensations.

2. The Bureau of Medicine and Surgery approves the policy of the Veterans' Bureau in the cases of Veterans' Bureau patients treated in United States naval hospitals, and quotes for your information the above reference:

"In response to the attached inquiry, it is the policy of the Veterans' Bureau to supply to the patients themselves certificates of illness when it is clear that such certificates are desired for the advantage of the claimant himself, particularly in connection with securing insurance from private or fraternal companies.

"The general policy of the Government not to release medical information has, of course, in view the protecting, first, the patient himself, secondly, the interest of the Government.

"In a case where a certificate is desired to secure insurance from private organizations, it is clear that only the interest of the patient are served and that the Government is quite unlikely to suffer any inconvenience."

E. R. STITT.

Circular letter.
Serial No. 175-1922.

WJCA:ESK 129733(41).
WASHINGTON, D. C.,
14 April, 1922.

To: All naval hospitals.

Subject: Right of Veterans' Bureau patients to receive treatment in a soldiers' home in the event of disallowance of claim by Veterans' Bureau.

Reference: Letter from director, U. S. Veterans' Bureau, EKH-frd-10-EO of 7 April, 1922.

1. For your information there is quoted herewith the contents of a letter from the director of the U. S. Veterans' Bureau under date of 7 April, 1922 (EKH-frd-10-EO):

"It is requested that instructions be issued to the commanding officers of all hospitals under your jurisdiction rendering treatment to beneficiaries of the U. S. Veterans' Bureau to insure that a claimant who is hospitalized as an emergency case, pending the adjudication of his claim, will be apprised of his right to receive treatment in a soldiers' home in the event of disallowance of the claim by this bureau, which necessarily terminates his further right to treatment through the bureau.

"Any honorably discharged ex-service man who is disabled and in need of medical care and hospital treatment is entitled to receive this treatment at a soldiers' home, and it is desired by this bureau that every claimant whose case is disallowed be acquainted with his right in this respect."

E. R. STITT.

INFORMATION FOR NEXT OF KIN.

REGARDING EXPENSES IN CONNECTION WITH THE PREPARATION, INCASEMENT, AND
TRANSPORTATION OF THE REMAINS OF THE DEAD.

All expenses in connection with the preparation, embalming, clothing, and incasement of the remains of Navy and Marine Corps dead and of transportation to such point as may be designated by the next of kin are borne by the Navy Department.

The remains are incased in the Navy standard shipping casket, designed to withstand shipment from the most distant parts of the world and to meet every requirement of the boards of health of foreign countries and of the different States. This casket is used alike for officers and enlisted men, no distinction being made for rank, and it is not customary to make transfer to a more elaborate casket. The United States ensign forwarded with the remains is for use at the funeral, and thereafter becomes the property of the next of kin.

Where the next of kin have been informed of the shipment of a body at Government expense, and through some mistake the transportation company endeavors to collect transportation charges, payment should be refused and a telegram sent immediately to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., collect, stating the circumstances.

After the remains have been delivered to the next of kin at the place designated by them, the Navy Department is unable to defray any of the expenses which may be incurred in connection with the funeral, interment, etc., there being specific law prohibiting such payment. The act of Congress approved October 6, 1917, however, provides for payment by the United States Veterans' Bureau, Washington, D. C., of burial expenses not to exceed \$100 in cases where the deceased was in the service prior to February 9, 1922. Unless further legislation shall be enacted, persons enlisting or reenlisting on or after February 9, 1922, are not entitled to the benefit of this \$100 allowance for burial expenses.

All officers and enlisted men of the Navy and Marine Corps are entitled to burial, with military honors, in the National Cemetery at Arlington, Va. (near Washington), or in any one of the national or naval cemeteries located at different points throughout the country, and when such interment is made no expense whatever devolves upon the relatives of the deceased. The graves in these cemeteries are marked with suitable headstones and are perpetually kept in perfect condition.

58448-23-8

N63-EMT 573-17.

NAVY DEPARTMENT, BUREAU OF NAVIGATION,
Washington, D. C., 28 March, 1922.

BUREAU OF NAVIGATION CIRCULAR LETTER NO. 12-22.

To: All ships and stations.

Subject: Advancement in rating.

Reference: Articles D-4120 to D-4123, inclusive.

D-4100 to D-4102, inclusive.

D-4200 to D-4210.

Bureau of Navigation Manual.

1. It has become apparent that with the former and present methods of advancement in ratings the bureau can not keep accurate control of the number of men in the various petty officer ratings, nor can it adjust the correct proportion in the various grades throughout the service, both of which have become very necessary with the present system of appropriation by Congress for the "Pay of the Navy." To this end the bureau will control all advancement of petty officers according to the needs of the service, and the above references will be considered in abeyance until further orders.

2. After a sufficient time has elapsed to judge the effects of this method on the service, and the amount of clerical work entailed, the bureau will request comment thereon from commanders in chief and other officers in authority, and will then decide whether to adopt some other method or to continue the procedure herein outlined. Commanding officers are directed to note in appropriate place such paragraphs of the Bureau of Navigation Manual as are placed in abeyance.

3. *Advancement in rating.*—The following procedure will be followed from date of receipt of this letter:

(a) Apprentice seamen will be advanced to seamen 2c prior to transfer from training stations.

(b) *Other lower ratings.*—Men to be considered qualified for advancement to the lower ratings (that is, other than petty officers' ratings or officers' cooks and stewards) must serve in the next lower rating with an average of at least 3.5 each in proficiency in rating, sobriety, and obedience for six months. When qualified as above, commanding officers may advance men to *fill vacancies in complement* to ratings other than petty officers or officers' cooks and stewards without reference to the bureau.

(c) *Petty officers.*—Men to be considered qualified for advancement to any petty officer rating or to officers' cooks and stewards must serve in the next lower rating with an average of at least 3.5 each in proficiency in rating, sobriety, and obedience for at least one year. Men who are so qualified and who are considered good petty officer material may be recommended by name to the Bureau of Navigation for advancement. The bureau will notify the commanding officer of receipt of this recommendation and when vacancies exist will authorize advancement. No man will be advanced to a petty officer rating or to officers' cook or steward without authority from the Bureau of Navigation.

(d) *Chief petty officers.*—Petty officers, 1st class, will be advanced to chief petty officers by authority of the Bureau of Navigation as heretofore. Such

men will not be recommended for advancement until they have served one year in their present grade with an average of 3.5 each in proficiency in rating, sobriety, and obedience. At least six months of said service in grade shall have been on seagoing vessels, in the field with the Marines beyond the continental limits of the United States, or, in the case of aviation ratings, with an operating air station or aviation detachment. Transcript of record on Form N, Nav. 21, and report of examination on Form N, Nav. 524, must accompany such recommendation.

(e) Commanding officers, upon receipt of information that men have been placed on the bureau's eligibility list for advancement in rating, should not subsequently request information from the bureau as to the standing of any individual. This is necessary in view of the shortage of clerical force in the bureau to answer such correspondence.

(f) All changes in ratings, except reduction, will be made on the first day of a calendar month.

(g) The bureau will consider advancement to the lowest petty officer rating in each branch of men who have not reached the highest nonrated grade. This applies particularly to graduates of trade schools.

(h) Ex-service men who have lost continuous service and men who have been disgraced for any cause may be recommended for advancement to the Bureau of Navigation and will be handled as individual cases in accordance with the needs of the service and the record of the man concerned.

4. *Permanent appointments.*—Chief petty officers with acting appointments may be recommended to the Bureau of Navigation for permanent appointment after completion of one year's service in grade with an average of 3.5 each in proficiency in rating, sobriety, and obedience. At least six months of said service in grade shall have been on seagoing vessels, in the field with the Marines beyond the continental limits of the United States, or, in the case of aviation ratings, with an operating air station or aviation detachment. Transcript of record on Form N, Nav. 21, and report of examination on Form N, Nav. 524, must accompany such recommendation. No permanent appointments will be issued except by specific authority of the Bureau of Navigation.

5. Upon receipt of this letter Alnav 75, 1921, and 2, 1922, and all other instructions in so far as they pertain to the advancement of enlisted men will be considered canceled, or held in abeyance.

THOMAS WASHINGTON.

The attention of all medical officers is called to the following general order which, as is stated, was promulgated to prevent the payment of the six months' gratuity to those not entitled to it under the law. This order requires an additional entry to be made on all reports of death.

GENERAL ORDER
No. 82.

NAVY DEPARTMENT,
Washington, D. C., March 1, 1922.

1. It is directed that hereafter a statement shall be made on each death certificate that a court of inquiry, board of inquest or investigation will, or will not, be held, in order to prevent the payment of six months' gratuity to those not entitled to it under the law.

EDWIN DENBY,
Secretary of the Navy.

Circular letter.

Serial No. 176-1922.

WSG/T 132687-0(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,

Washington, D. C., April 20, 1922.

To: Commandants, navy yards and stations, and Military Governor of Santo Domingo.

Subject: Radio telegraph; pigeons; medical supplies for.

References: (a) Letter from engineer officer to commandant, navy yard, Washington, #RTS/pgn, April 10, 1922.

(b) Comdt's 1st end. #4898X, April 11, 1922.

(c) Bur. of Engineering's 2d end. #618101-1207-W, April 18, 1922.

1. The Bureau of Engineering has requested that certain medical supplies be furnished by this bureau for the care of pigeons.

2. Please direct the medical officers of the dispensary or other medical activity under your command to make issues, without charge, to the radio material officer, as further indicated in paragraphs 3 and 4 of this letter; except that it is not considered necessary that the pigeon stations should draw from their maintenance yards when medical stores are more nearly available.

3. The following is an estimate of the approximate quantities required during one year for 50 pigeons, which is the normal complement of most naval pigeon lofts, except at Anacostia, Hampton Roads, Pensacola, and San Diego:

Epsom salts.....	$\frac{3}{4}$ lb.	Burnt alum.....	4 oz.
Castor oil.....	1 pt.	Potassium permanganate..	$\frac{1}{2}$ lb.
Cod-liver oil.....	1 pt.	Copper sulphate	4 oz.
Zinc ointment.....	4 oz.	Boric acid.....	$\frac{1}{2}$ lb.

4. Burnt alum will soon be available for issue at the naval medical supply depot.

5. The following is a list of existing pigeon stations and the maintenance yard of each:

Pigeon station.	Maintenance yard.
Anacostia.....	Washington.
Newport.....	Boston.
Coco Solo.....	Canal Zone.
Dahlgren	Washington.
Great Lakes	Comdt. Ninth Naval District.
Hampton Roads.....	Norfolk.
Pensacola.....	Pensacola Air Station.
Quantico.....	Washington.
Santo Domingo.....	Military Governor, Santo Domingo.
San Diego.....	Mare Island.
Pearl Harbor.....	Pearl Harbor.
Guam.....	Guam.

Circular letter.

Serial No. 177-1922.

HEH: GA 124842(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 20, 1922.

To: All medical and dental officers.

Subject: Revision of Form K Dental.

1. Form K Dental has been revised to the form of a simple statistical report. It is desired that the use of the new forms become effective with the report

for the month of July, 1922, at which time the supply of the old Form K Dental remaining on hand will be destroyed.

2. An initial distribution will be made to dental officers.

3. Form K Dental should be submitted monthly, as soon as practicable after the last day of the month, through the medical officer to the Bureau of Medicine and Surgery.

4. Additional supplies of the new Form K Dental may be procured from the Naval Medical Supply Depot, Brooklyn, on Form O as needed.

E. R. STITT.

Circular letter.
Serial No. 178-1922.

No. 124680(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 21, 1922.

To: All medical and dental officers.

Subject: Elimination of dental record sheet from health records.

1. The dental record sheet is hereby canceled, as this sheet has been eliminated from the health record now in the hands of the printer. The supply of dental records on hand should be destroyed.

2. No change has been made in the dental abstract, which will be retained as a part of the health record as heretofore.

E. R. STITT.

Circular letter.
Serial No. 179-1922.

SDS WHM-HCM 124842(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 21, 1922.

To: All medical officers.

Subject: Admission to the sick list of personnel of vessels and stations to which no medical officer or hospital corpsman is attached.

1. It is directed that in the future when personnel of ships or stations to which no medical officer or Hospital Corps man is attached are admitted to the sick list and cared for by the medical department of another ship or station, the latter will prepare and forward to the Bureau of Medicine and Surgery a Form F card in every case. On line ten (10) of the Form F card the name of the actual ship or station to which the patient is attached should be inserted, followed by the name of the forwarding office, e. g., "U. S. S. *Partridge* by Dispensary, Navy Yard, New York."

2. Such cases will not be included on the reports from the forwarding office.

3. Personnel of yard and other craft attached to a navy yard or station will, however, be reported as at present.

E. R. STITT.

Circular letter.
Serial No. 180-1922.

WHM-HCM SDS 128586(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 21, 1922.

To: All navy yards, stations, recruiting stations, marine barracks, and receiving ships.

Subject: Discharge of personnel from the naval service in accordance with approved recommendation of a board of medical survey.

Reference: (a) Paragraph 2041, "Manual for the Medical Department, 1917."
(b) Paragraph 2284, "Manual for the Medical Department, 1917,"
under invalided from the service.

1. During the calendar year 1921 seventeen (17) cases were invalided from the service without ever having been admitted to the sick list in accordance with reference (a), and one hundred and seventeen (117) cases were invalided from the service without having been readmitted (RA) and discharged as "IS" in accordance with reference (b), principally as follows:

Training stations, 7 cases.

Marine barracks, 68 cases.

Marine recruiting stations, 4 cases.

Navy yards, 6 cases (all marines).

Naval stations, 11 cases (9 marines).

Receiving ships, 8 cases.

2. The checking up of such cases entails much time and work in the bureau, all of which would be unnecessary if the provisions of the above references were carried out.

E. R. STITT.

Circular letter.
Serial No. 181-1922.

HWS : MFD 129504(44).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 24, 1922.

To: All medical officers.

Subject: Care of the dead, embalming and preparation of remains.

References: (a) Article 908, Navy Regulations.

(b) Article 1513, Navy Regulations.

(c) Article 1841, Navy Regulations.

(d) M. & S. circular letter No. SD-129504, June 24, 1918.

1. The bureau's circular letter of June 24, 1918 (reference d), is hereby canceled, and care and disposal of the remains of the dead will be governed by the above-mentioned articles of Navy Regulations and the instructions contained in this letter. It is directed that the contents of this letter be communicated to all naval personnel having to do with embalming.

2. It is incumbent on all Navy embalmers to exercise great care in the preservation of bodies, and their preparation for the casket, so that they may reach relatives showing evidence of respectful and careful handling, without signs of decomposition and with the so-called natural appearance retained.

3. Before beginning the injection, complete the shaving and modeling of the features. A liberal application of vaseline will prevent subsequent drying, an important matter in respect to the face and hands.

4. It is not necessary to drain the veins of contained blood, although this is recommended as tending to produce a more pleasing appearance of the body and to lessen the liability to the development of discolored spots and localized collections of gas.

EMBALMING FLUID FORMULA.

Liquid formaldehyde.

(U. S. P. solution of formaldehyde), 13.5 c. c.

Sodium borate (borax), 5 gms.

Glycerin,¹ 5 c. c.

Water, sufficient to make 100 c. c.

¹ Optional.

5. Should the solution of formaldehyde contain less than 37 per cent of formaldehyde gas, the amount used should be increased proportionately.

6. The solution is irritating to many skins, and some form of protection is advisable. Gloves may be worn in special cases, but in general it will be found more convenient, and equally safe, to anoint the hands prior to beginning work with a heavy protective unguent.

7. The exact composition of an embalming fluid is of less importance than the method of injecting it; but service embalmers, who may be acquainted with civilian practice, and inclined to follow it, should remember that methods which have proved equal to preserving remains for a few days in temperate regions may be entirely inadequate to preserve bodies for months in the Tropics. The fluid represented by the formula quoted (Francis) will retain its stability for more than two and one-half years; it has proved effective in preserving human subjects exposed for two months to a temperature of 98° F., and the property of formaldehyde in acid solution of bleaching muscular tissue to an ashy gray is overcome by the addition of borax, which furnishes the desired alkalinity without causing deterioration of the solution. This formula will be used, therefore, in all cases.

8. The fluid hardens tissues so rapidly that thorough penetration to more remote parts is often hindered. For this reason the whole procedure should be carried out expeditiously, and it is recommended that at each site specified the injection be started with half-strength solution; when the return flow is established, the full-strength solution should then be used as directed in the succeeding paragraphs.

9. The pressure essential to successful injection may be obtained either by elevating the container to a height of about 6 feet, or by means of a bicycle foot pump. The details requiring attention in employing either method will suggest themselves.

10. *Method of embalming.*—The procedure, to be satisfactory, requires both arterial and cavity injection.

11. *Arterial injection.*—The arterial system shall be injected with an amount of the prescribed embalming fluid equal to 15 per cent of the body weight, estimating 450 c. c. of fluid as 1 pound.

Inject each femoral artery toward toes with 2 per cent body weight.

Inject each brachial artery toward fingers with 1 per cent body weight.

Inject one common carotid artery toward head with 2 per cent body weight.

Inject same common carotid artery toward heart with 7 per cent body weight.

Total amount of fluid, including both femorals and both brachials, 15 per cent body weight.

12. The technique of injection is important because prolonged preservation will depend upon saturation of every tissue of the body with embalming fluid. To insure uniform distribution it is usually necessary to make all six injections. The return of fluid through the veins while the extremities are being injected will indicate saturation of the extremities, and the return of fluid during the carotid injection upward will indicate sufficient fluid has been injected into the head and upper extremities.

13. Penetration is promoted by repeated flexion and extension of limbs, and by massage of soft parts. An advancing line of firmness of the tissues may be taken as an indication of the progress of the fluid.

14. It is an easy matter to overinject so that the face and hands are puffy and unnatural. To avoid this, two signs may be accepted as indicating that sufficient fluid has been used, regardless of the actual amount injected, namely,

first, if the eyes, lips, or one side of the face become overdistended, or in the case of an extremity, when it is apparent that the fluid has circulated from the smaller arteries through capillaries in the veins; and second, when the tissues of a region are uniformly firm, with no "soft" areas remaining.

15. Overinjection, however, is not objectionable if a long time is to elapse before the remains are to be viewed, since a slow shrinkage of the body usually takes place.

16. When the carotids are being injected, massage of the face and adjacent parts is important, it being especially necessary to make sure that the fluid reaches less vascular parts such as the tip of the nose and margins of the ears. Here, as elsewhere, palpable firmness of the tissues is the indication of successful injection. If any of these parts remain soft after completion of the arterial injection and show signs of "skin slipping," fluid should be introduced by means of hypodermic syringe, the point of the needle being inserted through the ear, hair line, nostril, or mouth, so that the puncture may be invisible.

17. When, as sometimes happens, it is impossible to attain uniform firmness at the first injection, a second injection undertaken the next day often reaches the soft areas.

18. *Cavity injection.*—Besides injection of the arterial system, cavity injection should be performed, as much additional fluid being used for this purpose as may be required. When circumstances permit delay, it is well to postpone cavity injection until several hours have elapsed after the arterial injection has been completed. By that time, if a second arterial injection is to be required, the necessity for it will be apparent, and it can then be undertaken prior to introducing the breaks in the arterial system entailed by cavity injection.

19. *Thorax.*—By means of aspiration at several points, remove all body fluids and inject each pleural cavity with embalming fluid under moderate pressure until a slight epigastric fullness becomes apparent.

20. *Abdomen.*—By means of aspiration, the point of the needle being extensively moved about, remove as far as possible all gas, liquid intestinal contents, and pathological fluids. Then inject embalming fluid, again moving the needle point about extensively, until slight distention is apparent. Kneading of the abdomen favors diffusion of the fluid.

21. After autopsy bodies are to be embalmed in the same way, but in such cases the cavities of the abdomen, chest, and skull, after complete removal of all viscera, shall be packed with absorbent cotton saturated with embalming fluid.

22. If fluid can not be forced into an artery because of clots or other reasons, such as mutilation or advanced decomposition, multiple injections may be made into the tissues, which should then be wrapped in cotton saturated in embalming fluid. In such case, further, the anus, mouth, and nostrils shall be plugged with cotton soaked in embalming fluid, and the entire body, including the face, ears, and hair, shall be washed with the fluid.

23. *Contagious disease.*—In the case of a body dead of smallpox, plague, Asiatic cholera, typhus fever, diphtheria, or scarlet fever, the remains, after being washed, and after completion of the procedures described, shall be bandaged completely, excepting the head, with muslin soaked in embalming fluid. The hands and face shall be enveloped in a suitable cloth saturated with embalming fluid.

EL. R. STITT.

Circular letter.
Serial No. 182-1922.

WJCA: ESK 129733(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 26, 1922.

To: All naval hospitals.

Subject: Occupational therapy for Veterans' Bureau patients.

Reference: Letter from Assistant Director, U. S. Veterans' Bureau to Medical Division, U. S. Veterans' Bureau, dated April 18, 1922.

1. For your information there is quoted herewith the contents of a letter from the Assistant Director of the U. S. Veterans' Bureau under date of April 18, 1922:

"Inasmuch as prevocational training carried on in hospitals, irrespective of its character, is really for the purpose of keeping the patient occupied, or for some special therapeutic effect, all such work should be considered as occupational therapy. Hereafter the term 'prevocational training' will not be used in connection with the reconstruction work in hospitals. The term to be used is 'occupational therapy.'

"Occupational therapy, as so used, will be understood to include all of the courses previously supervised by the Reconstruction Section. It will include all types of training or employment given in hospitals, whether carried out as purely therapeutic measures, or purposely to occupy the time of the patients, or preliminary work toward a vocation."

E. R. STITT.

Circular letter.
Serial No. 183-1922.

WJCA: ESK 129733(33).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 28, April, 1922.

To: All naval hospitals.

Subject: Re Discharge from hospitals of Veterans' Bureau patients for disciplinary reasons.

References: (a) Bureau of Medicine and Surgery circular letter Serial No. 171-1922-129733(33) of March 27, 1922.

(b) Letter from the Director, U. S. Veterans' Bureau REH/eus: 10-Hospital Section dated April 26, 1922.

1. In accordance with reference (b) you are directed to correct reference (a) as follows:

Change the tenth line from the bottom of the first page which reads "confinement to a disciplinary ward and withholding of" to read as follows: "restriction to a ward or wards and withholding of."

E. R. STITT.

Circular letter.
Serial No. 184-1922.

WRJ: THC 132687-0(51).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 2 May, 1922.

To: All naval hospitals (continental limits).

Via: Commandant.

Subject: Occupational therapy for Veterans' Bureau patients.

Reference: Bureau's circular letter No. 129733(43) of April 26, 1922.

Enclosures: (2). Forms #75 and #80, Civil Service Commission.

1. The Navy Department has agreed, at the request of the Veterans' Bureau, to provide personnel, equipment, and material to cover occupational therapy in connection with the hospitalization of U. S. Veterans' Bureau patients.

2. Occupational therapy, in connection with the treatment of Veterans' Bureau patients, will be considered as an integral part of the functions of the hospital in the same manner as the several specialized services are supplied, that is, its surgical service, its medical service, etc. In other words the commanding officer of the hospital will exercise the same control and administer this type of service in the same manner as other departments of the hospital.

3. Requisitions for material for use in connection with this service will be prepared on the regular open-purchase requisition Form No. N. M. S. 1, and submitted to the bureau for approval. Requisitions will conform with all the requirements of article 1607, U. S. Navy Regulations. In the event that only proprietary articles will meet the requirements, the certification required by paragraph 2, subparagraph (L), will be used. It will also be necessary to have an estimated cost on each requisition.

4. A request for an allotment will be submitted by each activity engaged in this service for an amount sufficient to cover such supplies as may be secured on stub requisition from the local supply officer.

5. As the Veterans' Bureau will bear the entire expense incident to this service, and for accounting reasons, it is directed that open-purchase requisitions and stub requisitions bear the following notation:

"The above equipment and material is required for use in connection with providing occupational therapy for Veterans' Bureau patients in naval hospitals."

6. An accurate inventory of all nonexpendable material used in this service will be prepared and maintained thereafter as a separate inventory of material under the cognizance of the Veterans' Bureau. The title to all material used in occupational therapy will remain vested in the U. S. Veterans' Bureau, and will be subject to disposition by that bureau when this work is discontinued.

7. Permission has been obtained from the Secretary of the Navy for the establishment at navy hospitals of the following positions:

Rating.	Pay.
Head physiotherapy aide.....	\$166. 66 per month.
Physiotherapy aide.....	142. 50 per month.
Occupational therapy aide.....	133. 33 to 150 per month.
Teacher (academic and commercial).....	133. 33 to 150 per month.
Educational director.....	200 per month.

8. Requests for personnel of this character will be submitted to the bureau as the needs develops, specifying the rating, proposed rate of pay, and, in the case of occupational therapy aides and teachers, the subject or course to be covered. Authority will then be granted for appointment from the lists of eligibles on file at the office of the district secretary of the Civil Service Commission. The appointments will be made in the same manner as are those in the clerical service of the Naval Establishment, and these employees will be subject to the same rules and regulations as regards hours of employment, pay, leave, retirement, etc., as are other employees of the classified service.

9. It is believed that appointment of physiotherapy aides from civil life will not be necessary, but that treatment of this character can be administered by members of the Hospital Corps and Nurse Corps now being trained. However, as above noted, the positions have been authorized and can be utilized if required.

10. Your attention is invited to the fact that the term "occupational therapy" as used in connection with the treatment of Veterans' Bureau patients does not include physiotherapy or hydrotherapy (reference). It is the policy of the bureau to provide physiotherapy and hydrotherapy for the common use of naval and Veterans' Bureau patients, the cost of such service to be prorated between the services.

11. The inclosed announcements of the Civil Service Commission, setting forth the requirements for appointment to these positions, are forwarded for your information. The position of occupational therapy aide will be filled from the register of "Reconstruction aide (Form No. 75; the positions of teacher and educational director will be filled from the register of "Teachers" and "Rehabilitation assistant" (Form No. 80).

E. R. STITT.

Circular letter.
Serial No. 185-1922.

WJCA: ESK 129733(43).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 6 May, 1922.

To: All naval hospitals.

Subject: Occupational therapy in U. S. naval hospitals.

References: (a) Letter from Director, U. S. Veterans' Bureau, MCG/jat; 10 of March 21, 1922.

(b) Bureau of Medicine and Surgery circular letter Serial No. 182-1922-129733(43) of 26 April, 1922.

1. In compliance with the request of the Director of the U. S. Veterans' Bureau as expressed in reference (a), the Bureau of Medicine and Surgery has completed arrangements whereby all personnel, equipment, and material to cover occupational therapy, reference (b), and physiotherapy for Veterans' Bureau patients in naval hospitals will, in the future, be provided by this bureau.

2. In order to simplify the rendition of necessary expense accounts for this work to the U. S. Veterans' Bureau for reimbursement, it has been decided that only Veterans' Bureau patients will be permitted to take advantage of occupational therapy, reference (b), provided by the civilian personnel referred to in paragraph 1. Occupational therapy for naval personnel will be furnished by the Red Cross and in no instance will naval personnel receive instruction from the civilian occupational therapy teachers supplied for Veterans' Bureau patients.

3. In view of the proposed plan to utilize naval and not civilian personnel for physiotherapy work in naval hospitals, no distinction will be made between naval and Veterans' Bureau personnel in so far as physiotherapy is concerned.

E. R. STITT.

Circular letter.
Serial No. 186-1922.

WJCA: ESK 129733(53).
WASHINGTON, D. C.,
16 May, 1922.

To: All naval hospitals.

Subject: Occupational therapy for Veterans' Bureau patients in United States naval hospitals; quarterly reports concerning.

Reference: (a) Bureau's circular letter, Serial No. 185-1922 of 6 May, 1922, No. 129733(43).

1. On May 1, 1922, the Bureau of Medicine and Surgery, Navy Department, assumed entire charge of all personnel, equipment, and material used in con-

nection with occupational therapy and physiotherapy for Veterans' Bureau patients in United States naval hospitals.

2. In the future no reports or other information will be furnished by the occupational therapy personnel. These employees are employed by the Navy Department and have no further connection with the Veterans' Bureau. All reports, etc., must be forwarded by, and information furnished by, the commanding officers of the various hospitals.

3. On June 30, 1922, and at the end of each quarter thereafter, commanding officers will forward to the Bureau of Medicine and Surgery reports concerning occupational therapy for Veterans' Bureau patients in the form and order indicated below and containing the following information:

(a) Name, rate under civil service, date of appointment, and salary of each employee connected with occupational therapy for Veterans' Bureau patients.

(b) List of courses taught Veterans' Bureau patients giving names of instructors or teachers in each course.

(c) Hours spent by instructors in connection with occupational therapy.

(d) Hours actually occupied in teaching and manner in which time is spent when not actually teaching.

(e) Number of Veterans' Bureau patients availing themselves of courses in occupational therapy, giving number of patients and hours devoted to each subject.

(f) Detailed report of duties performed by educational director.

(g) Report of duties performed by clerks and stenographers.

NOTE.—In making reports, time spent by Veterans' Bureau patients in study outside classroom shall not be counted in with time actually under instruction. A separate report of time devoted to study can, if practicable, be made.

E. R. STITT.

Circular letter.
Serial No. 187-1922.

HWS: MFD 130402 (53).

WASHINGTON, D. C.,
May 17, 1922.

To: All medical officers.

Subject: Consultation service in roentgenologic interpretation.

Reference: Manual for the Medical Department, section 3221.

1. The general adoption of celluloid films in roentgenology has made practicable an extension of the service rendered by the U. S. Naval Medical School for many years in the examination of pathological specimens.

2. Any medical officer desiring to consult with a roentgenologist regarding the appearances in an X-ray film can obtain an opinion by forwarding the film or films in question addressed to the Commanding Officer, U. S. Naval Medical School, Washington, D. C., accompanied by a brief abstract of the clinical history of the case, and the following data written on each film: (a) Name and rate of patient; (b) name of hospital; and (c) "right" or "left."

3. In cases of injury to a joint, and always in any affection of the knee, a corresponding plate of the unaffected side should be inclosed. X rays of fractures should be taken in two directions, as nearly perpendicular to each other as possible. In chest cases take stereograms if available apparatus permits making them.

4. In order to comply with postal regulations, celluloid films are to be mailed in a metal container, sealed, and labeled "Inflammable."

5. Medical officers desiring photomicrographs of tissues, blood, or bacterial preparations or photographs of gross specimens for use as illustrations are reminded that the school is prepared to undertake such work on request.

E. R. STITT.

Circular letter.
Serial No. 188-1922.

WJCA: ESK 129733(52).

WASHINGTON, D. C.,
19 May, 1922.

To: All naval hospitals.

Subject: Re transportation for Veterans' Bureau patients upon discharge from U. S. naval hospitals.

References: (a) Telegram from District Manager, U. S. Veterans' Bureau, Atlanta, Ga., to Commanding Officer, U. S. Naval Hospital, Pensacola, April 17, 1922.

(b) Letter from Commanding Officer, U. S. Naval Hospital, Pensacola, to District Manager, U. S. Veterans' Bureau, Atlanta, Ga., April 29, 1922.

(c) Letter from Director, U. S. Veterans' Bureau, MCG; ecr: 10 Hospital Section, to the Surgeon General of the Navy, May 13, 1922.

1. For your information and guidance the contents of the above references are hereby quoted.

(a) "Bertrans Edwards C eleven fifteen five three naught issue transportation to Cincinnati Ohio."

(b) "The above-named man was this date discharged from further treatment at this hospital and has been furnished twenty-one meal and lodging requests in lieu of transportation to Cincinnati, Ohio, which was authorized by your telegram reference above."

The following statement was signed by the man concerned: "I hereby waive transportation to Cincinnati, Ohio, and accept in lieu thereof meal and lodging requests mentioned above."

(c) "There are inclosed herewith copies of a telegram from the district manager of the fifth district, Atlanta, Ga., to the Commanding Officer, Naval Hospital, Pensacola, Fla., and a letter from the commanding officer. It will be noted that the commanding officer, presumably upon the request of the claimant, issued in lieu of the transportation to Cincinnati, authorized by the district manager's telegram, 21 meal and 5 lodging requests. The commanding officer, as noted above, presumably did this upon the request of the claimant.

"It will be noted that the claimant waived his transportation to Cincinnati and accepted in lieu thereof the meals and lodging request noted. This, of course, is contrary to the practices of the Veterans' Bureau, as it is felt that the transportation to the claimant's home is a privilege based on humanitarian consideration and is not a vested right which the claimant may demand in cash or other valuable consideration.

"It is therefore requested that you instruct the commanding officers of the different naval hospitals caring for Veterans' Bureau claimants that transportation requests are to be issued only for legitimate and actual intended travel and can not be exchanged either for cash or for other valuable consideration."

E. R. STITT.

Circular letter.
Serial No. 189-1922.

WJCA: ESK 132687-0(54).

WASHINGTON, D. C.,
22 May, 1922.

To: All naval hospitals.

Subject: Occupational therapy for Veterans' Bureau patients in the United States naval hospitals.—Red Cross personnel.

Reference: (a) Bureau of Medicine and Surgery circular letter Serial No. 184-1922-WRJ-THC 132687-0(51) of May 2, 1922.

1. In order to simplify administrative control and reduce overhead expenses in connection with occupational therapy in naval hospitals, the Bureau of Medicine and Surgery has adopted the following policy in this connection:

2. Commanding officers will arrange the instruction of Veterans' Bureau patients in such a manner that all work in connection with the former term of occupational therapy (i. e., beadwork, basketwork, and any other branch which may have been included under the old terminology of occupational therapy) will be designated (assigned) to Red Cross personnel, and all other work such as that formerly included under the term of prevocational training (i. e., stenography, typewriting, English, reading, writing, bookkeeping, commercial subjects, agriculture, etc.) will be designated to civilians employed for that purpose.

3. In this way all naval and Veterans' Bureau patients will receive their instruction in branches included under the occupational therapy (old term) (par. 2) from the Red Cross personnel, and Veterans' Bureau patients *only* shall receive training and instruction in branches formerly included under prevocational (old term) (par. 2) from the civilian personnel supplied by this bureau for this particular work. It is not the intention of the bureau to furnish prevocational training to naval personnel.

4. Red Cross personnel will request all material and equipment necessary in connection with occupational therapy (old term) for Veterans' Bureau patients from the commanding officers of the naval hospitals, who will furnish the material and equipment in accordance with reference (a); that necessary for naval personnel will be obtained in the same manner as is now practiced by the Red Cross.

5. All articles made by Veterans' Bureau patients will be held pending legislation regarding their disposal, and information concerning this will be supplied in a subsequent circular letter.

E. R. STITT.

Circular letter.
Serial No. 190-1922.

WJCA: ESK 129733(52).

WASHINGTON, D. C.,
22 May, 1922.

To: All naval hospitals.

Subject: The handling of records for patients of the United States Veterans' Bureau in United States naval hospitals.

Reference: Letter from the Director United States Veterans' Bureau to the Surgeon General of the Navy, ML/EG: 6 of May 13, 1922.

1. For your information there is quoted herewith the contents of the above reference:

"In order to facilitate the handling of records for patients of the United States Veterans' Bureau, it is desirable to extend to other Government insti-

tutions certain procedure now followed in United States veterans' and United States marine hospitals. You are therefore respectfully requested to issue orders to all United States Navy hospitals treating patients of the United States Veterans' Bureau as follows:

"THE ASSIGNMENT OF REGISTER NUMBERS.

"a. Every patient of the United States Veterans' Bureau should receive a register number upon admission to the hospital. This number should be retained by the patient until his discharge, and it should appear on all records of the patient during the period of hospitalization, particularly admission and disposition cards, Form 1971-F.

"b. The register numbers for United States Veterans' Bureau patients should be assigned consecutively from one distinct series for each hospital.

"c. Only one number should be assigned to each patient during one continuous hospitalization.

"d. A new register number should be assigned upon readmission of the patient to the hospital.

"e. The series of register numbers for United States Veterans' Bureau patients should start with 1 and be carried on indefinitely until further advised.

"In order to start this system of register numbers all patients of the United States Veterans' Bureau remaining in the hospital on June 1, 1922, will be numbered from 1 up. The first new patient admitted on June 1, 1922, will be assigned the next highest numbers. For instance, if on June 1 there are 88 patients in the hospital, numbers 1 to 88 will be assigned to these patients. Number 89 will be assigned to the first new patient.

"A list of patients in the hospital on June 1, 1922, giving name, register number, date of admission, and diagnosis, should be sent in to the Director United States Veterans' Bureau, Washington, D. C., attention Medical Statistics Section.

"TRANSMISSION OF REPORT CARDS, FORM 1971-F.

"Two copies of report cards, Form 1971-F, will be executed upon admission and discharge of each patient in addition to copy retained at the hospital. One of the copies will be forwarded to the manager of the district where the hospital is located and one *direct* to the United States Veterans' Bureau, Washington, D. C. Cards to the Director United States Veterans' Bureau will be forwarded as follows:

"a. A manila envelope of special size (6 by 8½ inches), a supply of which may be obtained by requisition, should always be used.

"b. All envelopes bearing the name of the forwarding station should be numbered consecutively, beginning with 1 and marked thus, Cards 1971-F, package No. —.

"c. All envelopes are to be addressed to

The Director,
Attention Medical Statistics Section,
United States Veterans' Bureau,
Washington, D. C.

"Cards should never be allowed to accumulate any length of time, but should be forwarded as soon as possible after admission or discharge of patients.

"It is requested that two copies of above orders to hospitals be supplied to the Director United States Veterans' Bureau, attention Medical Statistics Section."

E. R. STITT.

Circular letter.
Serial No. 191-1922.

HBS: DRG 132609-0(54).

WASHINGTON, D. C.,
25 May, 1922.

To: All medical officers.

Subject: Surveys on Medical Department property.

1. The attention of all medical officers is called to the necessity for greater care in the preservation of Medical Department property.

2. Surveys are daily reaching the bureau which show many costly items received within the past year or two with recommendation from the board of survey that they be destroyed as of no value, deterioration due to "use," etc. In many instances the date of receipt is given as "unknown," original cost "unknown," or the word "missing" is used with the statement "no responsibility." Again, pocket cases, surgical instruments, or other cases are recommended for return to supply depot, and upon arrival at the depot it is found that they have been looted of their contents and only the bare cases returned.

3. The new supply table of the Medical Department, 1922, provides instruments and spare parts for cabinets, cases, and pouches; therefore, when a few of their contents are deteriorated or broken only the actual instruments so affected should be surveyed and requisitions submitted to supply the missing parts. Medical officers and Hospital Corps men should carefully study the new supply table of the Medical Department.

4. Upon receipt of nonexpensive medical supplies property cards must at once be prepared showing date of receipt, cost of each item, and number and fiscal year of requisition. The bureau will then be able to determine when such property is surveyed if reasonable service has been obtained therefrom. Surgical instruments should, with reasonable care, last for a number of years, and platinum needles, which are so frequently surveyed in quantities and are expensive, should last indefinitely.

5. It is impracticable to enumerate in detail the many expensive items surveyed which appear to have rendered but little service, but if the same care is given by medical officers and Hospital Corps men to Government property that is used with respect to their personal property the bureau will be relieved of considerable embarrassment from needless expenditures, which is essential in these days of economy.

6. The Secretary of the Navy, in a recent letter to all bureaus, directed that disciplinary action be taken against persons guilty of neglectful responsibility in the care of Government property. Property surveys will therefore receive special attention in future.

E. R. STITT.

Circular letter.
Serial No. 192-1922.

HBS: DRG 132679(54).
WASHINGTON, D. C.,
24 May, 1922.

To: Medical officers on shore stations in the United States.

1. This bureau's reply to an inquiry made by Commanding Officer, Naval Medical Supply Depot, Brooklyn, New York, is published for information of officers concerned:

"To: Commanding Officer, Naval Medical Supply Depot, Brooklyn, New York.

"Subject: Complement of shore stations relative to quantities of Medical Department supplies to be furnished.

"References: (a) Letter, Commanding Officer, NMSD., Brooklyn, M-2-2-
ESB: KG of 12 April, 1922.

(b) U. S. Navy Regulation, 1920, Article 1185 (1)-(7)-(9).

(c) U. S. Navy Regulations, Article 1575-1580."

1. Replying to question contained in reference (a), "Are expenditures authorized under Medical Department of the Navy appropriations for double the number of civilian attachés to the number of Navy personnel attached to a station." It has been decided that on shore stations in the United States where the treatment of families of officers and enlisted men and first-aid treatment for civil employees, as provided in reference (b), is required, medical and surgical supplies shall be requisitioned for on the basis of active Navy and Marine Corps complement allowance.

2. Medical supplies over the complement allowance will be furnished such stations in such quantities as may be necessary for the treatment of families of officers and enlisted men, and first-aid treatment of civil employees, as provided in reference (b), but the additional supplies required for this purpose must be made the subject of a special letter to the Bureau to accompany the requisition in each instance.

3. The unlimited expenditure of Medical Department supplies for treatment of civilians, not authorized by reference (b), is not approved, and the medical officers of shore stations concerned will be so informed.

E. R. STITT.

Circular letter.

Serial No. 193-1922.

WJCA:ESK 132687-0(61)..

WASHINGTON, D. C.,

5 June, 1922.

To: All naval hospitals.

Subject: Care of Veterans' Bureau patients in U. S. naval hospitals.

Reference: Letter from Director, U. S. Veterans' Bureau, to Surgeon General, U. S. Navy, dated May 29, 1922.

1. Arrangements have been made whereby, during the fiscal year 1923, the Bureau of Medicine and Surgery, Navy Department, will designate and maintain the following number of beds in the respective naval hospitals mentioned below for the use of U. S. Veterans' Bureau patients:

Chelsea, Mass.....	500
Great Lakes, Ill.....	650
League Island, Pa.....	125
Newport, R. I.....	50
New York, N. Y.....	400
Norfolk, Va.....	100
Pensacola, Fla.....	25
Portsmouth, N. H.....	50
Washington, D. C.....	250

2,150

2. Should the necessity arise the Veterans' Bureau has been authorized to utilize from time to time a certain limited number of beds at the following naval hospitals:

U. S. Naval Hospital, Mare Island, Calif.

U. S. Naval Hospital, San Diego, Calif.

U. S. Naval Hospital, Honolulu, Hawaii.

U. S. Naval Hospital, Manila (Canacao, P. I.).

58448-23-9

It is not thought that the utilization of hospital facilities in these hospitals will be of a sufficiently continuous or extensive nature to warrant any increase of personnel to care for Veterans' Bureau patients.

3. Commanding officers of naval hospitals other than those referred to in paragraphs 1 and 2 are directed to admit Veterans' Bureau patients in emergencies and to notify the Bureau of Medicine and Surgery of all such admissions.

E. R. STITT.

Circular letter.

Serial No. 194-1922.

HBS-DRG 125884(61).

WASHINGTON, D. C.,

7 June, 1922.

To: All medical officers.

Subject: Alcohol, X-ray supplies, laboratory supplies, and surgical instruments, requisitions for.

References: (a) Bureau medicine and surgery circular letter, No. 172-1922; dated 28 March, 1922.

(b) Supply table of the Medical Department, U. S. Navy, 1922.

I. ALCOHOL.

1. Alcohol for use by the Medical Department of the Navy will in future be obtained on Form B or Form 4 requisitions from nearest naval medical supply depot; quantities required will correspond with complement allowance prescribed on page 9, supply table of the Medical Department, 1922. This product, furnished in 500 cc. bottles exclusively, is a cologne spirit suitable for internal administration. Naval hospitals are authorized to procure additional alcohol needed for nonmedical use from supply officers on stub requisitions, chargeable to allotments granted by this bureau for the purpose.

II. X-RAY SUPPLIES.

2. Estimates for laboratory and X-ray supplies submitted to the bureau, in accordance with instructions contained in reference (a), indicate that these instructions were in many instances misinterpreted, and numerous items were included in the estimates for laboratory supplies which are listed in the supply table of the Medical Department, 1922. The following additional instructions relative to proper procedure for obtaining such supplies are therefore issued:

(a) X-ray dental films and duplitized films will be furnished by Naval Medical Supply Depot, Brooklyn, N. Y., on letter request direct to that depot. These requests will not exceed estimates submitted to the bureau in compliance with reference (a). Upon receipt of such request by the commanding officer, Naval Medical Supply Depot, Brooklyn, the contractor will be directed to forward films direct to the activity requiring them. The expenditure will be covered by emergency issue slip in the same manner as are biologicals at present. Upon receipt of the films by the activity concerned the responsible officer will immediately accomplish the emergency issue slip and return to the supply depot. This is important, as authority for payment for the films is contingent upon the receipt of these receipted slips. The films supplied will be freshly prepared and will bear a date of expiration of period of usefulness. It is contemplated that requests will be promptly filled, which will obviate the necessity for carrying a large stock of films on hand and insure fresh supplies when needed. Sufficient films for three months' supply only should be required at one time.

(b) X-ray chemicals (nonsupply table) will be obtained on Form 4 requisition from Naval Medical Supply Depot, Brooklyn, direct, within the estimates submitted to the bureau. These products will be supplied in the following standard size packages:

Barium sulphate for X-ray diagnosis, 1-pound carton or can.

Sodium sulphite in 5-pound bottles.

Chrome alum in 1-pound bottles.

Sodium hyposulphite in 25-pound kegs.

X-ray powders in size sufficient to make one gallon of developing fluid.

Potassium ferrieyanide in 1-pound bottles.

Other chemicals required are Form B items.

(c) Requisitions for dental film mounts, X-ray photographic papers, film-filling jackets, lantern slides and accessories, film hangers, developing trays, gloves, X-ray aprons, X-ray and kidney compressor bags, will be made on requisition Form 4, and forwarded direct to Naval Medical Supply Depot, Brooklyn, if within the estimates submitted to the bureau.

(d) Requisitions for X-ray Coolidge tubes will be made on requisition Form 4, submitted direct to the Naval Medical Supply Depot, Brooklyn, if within the estimates submitted to the bureau. In preparing requisition for Coolidge X-ray tube, radiator type, 10 milliamperes capacity, specify the make of machine with which tube is to be used.

(e) Requisitions for cassettes and intensifying screens will be made on requisition Form 4 direct to Naval Medical Supply Depot, Brooklyn, if within the estimates submitted to the bureau. Requisition for cassettes must specify dimensions of cassette required, especially the thickness, and the make of machine with which it is to be used. In preparing requisition for intensifying screens, specify the size of cassette with which they are to be used and whether the standard, thin, or both standard and thin, are required. These two items will not be carried by supply depot, but will be purchased upon receipt of requisition giving specifications.

(f) Requisitions for any other X-ray material required in emergency will be submitted to the bureau for approval, together with explanatory letter.

III. LABORATORY SUPPLIES.

3. Requisitions for laboratory supplies will be submitted in accordance with instructions in the supply table of the Medical Department, 1922, and will specify items listed in Parts I and III thereof wherever possible. Special attention is called to contents of cabinet, laboratory, Navy standard, which together with Form B chemicals, includes practically all apparatus and reagents required for usual laboratory examinations in accordance with modern methods. It will not be necessary to requisition for reagents of any other size containers than those specified in the supply table, nor to require a multiplicity of sizes of items such as test tubes, flasks, bottles, pipettes, etc.

(a) Requisitions for laboratory supplies listed in Part III of the supply table will be prepared on requisition Form 4 and forwarded direct to naval medical supply depots.

(b) Requisitions for items not listed in Part III of the supply table will be made on separate requisition Form 4 and forwarded direct to the Naval Medical Supply Depot, Brooklyn, N. Y., if within the estimates submitted to the bureau.

(c) Requisitions for laboratory supplies other than specified above will be made on requisition Form 4 and submitted to the bureau for approval, together with explanatory letter.

IV. SURGICAL INSTRUMENTS.

4. All requisitions for surgical instruments other than those listed in Part III of the supply table will be made on requisition Form 4 and submitted to the bureau for approval, together with explanatory letter.

E. R. STITT.

M-S. #132679(43).
41822CO-SD.

U. S. NAVAL MEDICAL SUPPLY DEPOT,
SANDS AND PEARL STREETS,
Brooklyn, N. Y., April 18, 1922.

To: All medical and dental officers.

Subject: Typographical errors in supply table, Form B and Form B-Dental.

1. The above-mentioned forms contain errors which should be corrected on each copy, as follows:

SUPPLY TABLE.

Page 5, 4th line, change "Shick" to "Schick."

Page 16, column B, strike out "Less than 75 men" and insert "75 to 150 men."

Page 21, strike out "Case, diagnostic, electric (recruiting)."

Page 27, items "Corks, bottle, Nos. 3, 4, 5, 6, 7 (16) . . . dozen 10 10 20 30 40 50 60 70 100" out of alphabetical order. Indicate by arrow that this item should follow item "Cork presser." (This change necessary to conform with Form B.)

Page 36, item "Illuminator, bracket, electric," strike out "110 volts" and insert reference number "(40)."

Page 36, item "Illuminator, bracket, electric, lamp for," strike out "110 volts" and insert reference number "(40)."

Page 40, item "Syringe, conductive anaesthesia, etc.," change "88" to "87."

Page 42, item "Atomizer, hand, etc.," change allowance "3" in column "Standard equipment," to "0."

Page 44, items "Argentum colloidal," change reference number "(24)" to "(42)."

Pages 46 and 47, insert reference number "(42)" after the following items: "Apron, operating," "Gown, operating," "Towel, hand," "Towel, crash," "Book, blank, small quarto," "Envelope, official size," "Eraser, rubber," "Ink-stand," "Pad, memorandum," "Paper clip," "Paper fastener," "Pencil, lead," "Penholder," "Pen, steel," "Rubber band," and "Rule."

Page 60, item "Gauge steel (Handerson)," change to read "(Henderson)."

Page 88, item "Water heater, electric," strike out the line "Water heater . . . number 1."

INDEX.

Page 90, "Bistoury, straight," strike out "84."

Page 91, "Bone curette," strike out "69."

Page 91, "Bucket, agate," change "29" to "30."

Page 92, "Card confusion colors," change "87" to "88."

Page 92, "Case diagnostic electric (recruiting)," strike out "21."

Page 93, "Combination syringe," strike out "77."

Page 93, "Corkscrew," insert page "27."

Page 93, "Cotton, absorbent," strike out "65," "66," "86," and "87."

Page 93, insert after "Cotton, absorbent," "Cotton, absorbent, compressed . . . pages 65, 66, 86, 87."

Page 93, "Curette, bone," strike out "69."

Page 94, "Diagnostic case, electric (recruiting)," strike out "21."

Page 95, "Diagnostic tags," change to "Diagnosis tags."

Page 97, "Hagedorn needles," change "24" to "23."

Page 99, after "Laryngeal mirror, handle," insert page numbers "58" and "72."

Page 99, strike out, "Matches, waterproof . . . 65."

Page 99, strike out "Methyl violet . . . 81."

Page 100, "Morphine sulphate hypo. tablet," insert page number "65."

Page 100, "Needle, suture, Hagedorn," change page "24" to "23."

Page 103, "Reamer, root," insert page number "39."

Page 103, "Repair tools, bridge," change "49" to "51."

Page 105, "Suture, needle, Hagedorn," change "24" to "23."

Page 107, "Urethroscope," insert page "63."

FORM B.

Page 13, strike out "Case, diagnostic electric (recruiting) (19) . . . number."

FORM B—DENTAL.

Page 3, Item "Illuminator, bracket, electric," strike out "110 volts" and insert reference number "(40)."

Page 3, item "Illuminator, bracket, electric, lamp for," strike out "110 volts" and insert reference number "(40)."

Page 11, the following items are not in alphabetical order according to the supply table: "Caryophylli, oleum," "Collodium flexile," and "Hydrargyrum."

Pages 13 and 14, insert reference number "(42)" after items: "Apron, operating," "Gown, operating," "Towel, hand," "Towel, crash, (38)," "Book, blank, small quarto," "Envelope, official size," "Eraser, rubber," "Inkstand," "Pad, memorandum," "Paper clip," "Paper fastener," "Pencil, lead," "Penholder," "Pen, steel," "Rubber band," and "Ruler."

Circular letter.

FEMcC-EFL 124842(103).

Serial No. 195-1922.

WASHINGTON, D. C., *June 13, 1922.*

To: All naval hospitals.

Subject: Report of board for consideration of standardized forms.

Reference: (a) Bureau's letter No. 124842(103) of February 14, 1922.

Enclosure: Report of board, No. 124842(103), June 6, 1922.

1. The recommendation of the board contained in the attached report is approved.

2. The new forms will be put into effect when the stock of old forms at the supply depot have been exhausted.

F. L. PLEADWELL, *Acting.*

FEMcC-EFL 124842(103).

WASHINGTON, D. C., *June 6, 1922.*

From: Board for consideration of standardized forms.

To: Chief of Bureau of Medicine and Surgery.

Subject: Report of board.

Reference: (a) Bureau's letter No. 124842(103) of Nov. 30, 1921.

(b) Bureau's letter No. 132-1921, of Oct. 16, 1921.

(c) Board's report of Jan. 30, 1922.

(d) Bureau's letter No. 124842(103) of Feb. 14, 1922.

1. In response to reference (d) seventeen reports were returned from the commands to which reference (c) was referred. Nine of the reports received expressed concurrence with the board's recommendations.

2. The following is an abstract of the criticism received and grouped under each form considered:

(a) *N. M. S. Form No. 10.*—"Recommended that the following be added immediately after absentee report (reverse side):

Mast report.

Name: rate: offense: date, etc.: Remarks.

This gives the commanding officer daily information as to all mast reports, awaiting-action cases, etc. (Pearl Harbor.)

"Daily personnel report, which should contain more than twenty-one wards" (Great Lakes).

"This form as submitted is incomplete in that summary does not show number of patients died, deserted, in confinement, on leave, or absent without leave. Summary should also show number of hospital corpsmen on duty, in confinement, on leave, or absent without leave." (Norfolk.)

"It is recommended that 'Changes in staff' be made a separate report instead of being printed on the back of the 'Personnel report.' The data for the changes in staff and the absentee report is, at a large hospital, more efficiently handled at a desk other than the one handling the personnel report, and, due to the delay often occasioned by definitely determining the absence of an individual, the distribution of the personnel report would be unnecessarily delayed." (New York.)

(b) *N. M. S. hospital Form No. 3.*—"Horizontal lines are not practicable in that copies seldom agree with original when inserted on typewriter, due to faulty printing. An unruled page, allowing names to be typewritten single spaced, will permit listing of twenty or more names instead of ten as on suggested form, an item of interest to large hospitals. Space allotted to listing of service records, health records, and pay accounts should be reduced, thus permitting long names to be written in full followed by service number. Numbering of lines is not necessary." (Norfolk.)

(c) *Baggage check.*—"In order to render this check more difficult to change or counterfeit in the case of loss, more important as a means of identification to the owner and to better serve its purpose as a baggage check, it is recommended that both the tag and its stub be numbered consecutively in conspicuous type." (Newport.)

"Recommended that first action section of stub have space for patient to sign as receipt. Stub to be filed by baggage man for future reference in case a claim is made for baggage or missing clothing after patient has left hospital.

"U. S. Naval Hospital _____

"All personal property received this date _____

"Witness: _____

"Bagroom keeper." (Pearl Harbor.)

"The advantages of this form believed to be of a doubtful nature. Experience at this hospital has demonstrated that only constant watchfulness on the part of the corpsman detailed in baggage room will prevent thieving, and it appears that the loss of baggage check and consequent finding of it by another

person would tend to give the finder access to baggage not his own were he inclined to be dishonest. The above remarks are based on the assumption that the possession of the detached part of the tag will gain access to baggage indicated on the check. It is suggested that the service number or some other form of a check appear on the original check (not on the duplicate) that can be furnished only by the bona fide owner of the baggage." (Charleston.)

(d) *Change of diagnosis.*—"This office recommends adoption of attached standardized forms with alteration of "Notice of change of diagnosis" to read as follows, due to the fact that patient might be carried with a diagnosis other than the one with which admitted to hospital:

"Diagnosis changed { From: -----
To: -----

(Annapolis.)

"Recommended space be provided for approval by executive officer in smaller hospitals, or by supervisors of medicine or surgery in the larger hospitals. Eliminates mistakes (technical or otherwise) by junior inexperienced medical officers and keeps immediate superiors familiar with status of patients under their supervision. Authorizes personnel office to make necessary record changes." (Pearl Harbor.)

"A similar scheme in the form of a memorandum has been tried out in this hospital and has not met with success. A book kept in the record office and accessible to medical officers is believed to give results and such book is now being used as an experiment in this hospital. Too often the card fails to reach the record office and only a constant check of health records insures the Form 'F' card being closed out and a new one for the new diagnosis opened. The book is believed to provide a more stable record." (Charleston.)

(e) *Operations scheduled.*—"It is believed that if space were provided on this form to show the ward to which patients to be operated on are assigned, it would aid in proper distribution of the several copies where more than one ward is concerned." (Charleston.)

"Suggested that word 'anesthetist' be added to the heading anesthetic. In most hospitals where there are several anesthetists, the above additional information assures equal distribution of this duty and gives necessary preparatory information." (Pearl Harbor.)

"'Operations schedule' should contain several more spaces for names," (Great Lakes.)

"That all new forms recommended in paragraph 7 be adopted except (b). It is believed that the 'Operations scheduled' in its present form could be omitted or modified for the following reasons:

"First. Emergency cases could not be planned in advance.

"Second. Operating surgeons must be allowed leeway as to what anesthetic is to be used, as the case comes to operation.

"Third. With a senior operator and several assistants, it is impossible to tell in advance which assistant would be given the opportunity to do routine work, as the need for post-operative watching of a patient and other conditions will modify the schedule.

"Fourth. Under present conditions most operating surgeons are men of sufficient experience to be trusted with the details of the work they are doing, and I believe all hospitals now have in effect some form of official approval of work planned, but not in such detail as indicated.

"Fifth. A schedule such as proposed would be constantly changed, either by additions or omissions, depending upon changed condition of patients. It would soon, of necessity, degenerate into a perfunctory, useless formality.

"Sixth. Many times the 'Professional assistant to the executive officer' or the executive officer has followed a case more carefully than the commanding officer, and the determination to operate, or not to operate, can be better decided by him than by the commanding officer. As a matter of fact, a majority of 'approvals' are in the nature of taking the recommendation of the 'Professional assistant to the executive' or the operating surgeon.

"Seventh. In most cases it would be as important for the commanding officer to give his approval for instituting radical treatment in medical cases as in the ordinary run of surgical cases. The question of venesection, the use of oxygen, and the more powerful forms of medication, are not ordinarily referred to the commanding officer for approval in advance, nor do I believe the average run of surgical cases need approval." (San Diego.)

The following are the views of the board regarding the above comments:

(a) *N. M. S. hospital Form No. 10.*—Inasmuch as the regulations require that a special report book be kept, which report book contains entries of all disciplinary refractions, further entries regarding this subject are deemed out of place on this form.

In order that more space for wards be allowed without increasing the size of the form, it is recommended that the horizontal lines be eliminated from the form as originally proposed. This will permit any probable number of wards to be enumerated.

The present form, if correctly made out, would show the disposition of all personnel in the body of the report. It is, therefore, recommended that no addition be made to the "summary of patients," since the aggregate of change in personnel of the day is believed to be sufficient for requirements. A complete daily summary for Hospital Corps men is believed to be unnecessary, as daily changes are infrequent and a weekly report is already in existence.

The recommendation of the New York hospital as to daily changes in staff would necessitate a new form, which is not recommended.

(b) *N. M. S. hospital Form No. 3.*—The board concurs in this recommendation and recommends its adoption.

(c) *Baggage check.*—The proposed form provides for a storage number.

Receipt of patient for baggage is covered by Form "G" when his signature is obtained on discharge or transfer; Form "G" should be filed in his jacket, thereby being made available for any future correspondence covering the subject.

The board believes that the duplicate checks should be in the custody of the ward nurse and not carried by the man concerned on account of possibility of loss. The nurse is in a better position to identify the man than the bag room keeper.

(d) *Change of diagnosis.*—The recommendation of Annapolis Hospital is concurred in.

If a hospital demands that this report be signed by the executive officer or supervisor of a department, this may be accomplished by having the proposed report initialed by the officer concerned.

It is the opinion of the board that while several hospitals are now using this form (which is believed to be adequate and its adoption recommended for this reason), nevertheless it would appear that the best procedure would be to return the health record at the time the change is made to the record office so that it may be checked by officers concerned and the record office.

A book for this purpose is not recommended.

(e) *Operations scheduled.*—The form as proposed is for the official notification and approval of an operation by the commanding officer and does not

abridge any of the prerogatives of the operating surgeon with respect to professional judgment.

Other suggestions not concurred in.

4. Copies of all forms recommended are appended.

F. E. McCULLOUGH,
Captain (M. C.) U. S. N.
H. W. SMITH,
Commander (M. C.), U. S. N.
H. L. GALL,
Chief Pharmacist, U. S. N.

Circular letter.
Serial No. 196-1922.

WJCA:ESK 129733(64).

WASHINGTON, D. C., June 29, 1922.

To: All naval hospitals.

Subject: Occupational therapy work for Veterans' Bureau beneficiaries; report of.

Reference: Letter from Assistant Director, U. S. Veterans' Bureau #BWC:
HW:R:10. Hosp. Sec.

1. In order that the United States Veterans' Bureau may have a complete record of all occupational therapy work done by U. S. Veterans' Bureau beneficiaries in U. S. naval hospitals, you are requested to forward, on the first of each month, a report covering this work for the past month.

2. It is understood that the committee composed of representatives of the Army, Navy, Public Health Service, Soldier's Home, and the U. S. Veterans' Bureau have adopted a new form for reports on this type of work. United States Veterans' Bureau form Med. 1870 will be used until such time as the newly adopted forms are received.

3. All of these reports shall be forwarded (in duplicate) by the commanding officers to the Director, U. S. Veterans' Bureau, via the Bureau of Medicine and Surgery.

F. L. PLEADWELL, *Acting.*

Circular letter.
Serial No. 197-1922.

WSG/T 132586, 132641.

WASHINGTON, July 12, 1922.

To: All naval hospitals, U. S. naval medical supply depots, and U. S. Naval Medical School.

Subject: (a) An act to readjust the pay and allowances of the commissioned and enlisted personnel of the Army, Navy, Marine Corps, Coast Guard, Coast and Geodetic Survey, and Public Health Service, approved June 10, 1922.

(b) An act making appropriations for the naval service for the fiscal year ending June 30, 1923, and for other purposes, approved July 1, 1922.

References: (a) ALNAV TWENTY-EIGHT, 4230-1230 of June 30, 1922.

Enclosures: (A) Copy of above (a) (H. R. 10972).

(B) Copy of above (b) (H. R. 11228).

1. The bureau encloses herewith copies of the two acts above mentioned, and directs that they be made available for all members of the staff, including hospital corpsmen engaged on office work; the acts are supplemental to one another, and should be considered together.

2. An accurate knowledge of appropriational matters is essential to the proper allocation of charges; that this knowledge is not so widespread throughout the Medical Department as it should be is evidenced by the large number of invoices received in the Bureau of Supplies and Accounts on which the wrong appropriations of the Bureau of Medicine and Surgery are debited.

3. The strictly bureau appropriations are found on pages 19 and 20 of the naval act.

4. The appropriation "Care of hospital patients" will continue under the immediate and direct control of the bureau, but *under no circumstances* will any charges be placed against it, except directly by this bureau.

5. Legislation relating to "Passenger-carrying automobiles" will be found on pages 20 and 21 of the naval act.

6. The value of commuted rations stopped on account of sick in hospitals is fixed by the naval act for the fiscal year 1923 at seventy-five (75) cents (page 17); this rate for three meals will govern the charges made against the pay of civilian employees for subsistence; it will also be the rate of charge in the duty officer's mess; the charge for less than three meals in all cases will be twenty-five (25) cents per meal.

7. The pay and allowances of members of the Nurse Corps are defined in sections 5, 6, and 13, of the "Act to readjust the pay and allowances," except that the naval act (Encl. B), page 17, provides for "subsistence in kind at hospitals and on board ship in lieu of subsistence allowance of female nurses."

Circular letter, serial No. 198-1922.

HWS:MFD. 125221 (71).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 13, 1922.

To: All medical officers.

Subject: Training of flight surgeons.

1. A large number of medical officers will be needed for training in aviation medicine and subsequent duty as flight surgeons.

2. The training period will consist of a course of instruction of approximately four months' duration either at Washington, D. C., or at Mineola, Long Island.

3. Any medical officer who may desire to identify himself with the specialty of aviation medicine is requested to make early application to the bureau, inclosing a report of a physical examination such as is prescribed for pilots.

E. R. STITT.

Circular letter, serial No. 199-1922.

SDS. HWM:HCM. 124842 (73).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 18, 1922.

To: All medical officers.

Subject: Forms N. M. S. "F." and N. M. S. "K.," revision of.

Inclosure: 1.

1. Form F has been revised to include all information necessary for the morbidity and mortality statistical purposes of the Bureau of Medicine and Surgery. Form K will therefore be abolished when the present supply of either Form F or Form K is exhausted.

2. Naval medical supply depots will not issue the new form while requests can be filled from the old stock on hand.

3. Ships and stations will continue to use the present forms until the stock of such is used up and until such time as the revised Form F is furnished by the depots.

4. Copy of the new Form F is attached for information; supply of which can be secured when needed from the nearest naval medical supply depot in the usual manner (Form O).

E. R. STITT.

Circular letter, serial No. 200-1922.

WSG/T. 125949 (54).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 17, 1922.

To: All naval hospitals, U. S. S. *Mercy* and *Relief*, sick quarters, marine barracks, Quantico, Va.

Subject: Subsistence of enlisted personnel of the Navy and Marine Corps (Regular and Reserve) during period granted leave from treatment in hospital.

Inclosure: (A) Bureau's attached 1st ind., No. 125949 (54), June 3, 1922.

1. The Bureau of Navigation in forwarding this bureau's first indorsement (inclosure) in its second indorsement No. 57369-140 of June 9, 1922, made recommendation, as follows:

"1. Forwarded. This bureau concurs in the opinions expressed in the letter of the Bureau of Supplies and Accounts and the first indorsement of the Bureau of Medicine and Surgery, and recommends that reference (b) be rescinded to take effect June 30, 1922. (Signed) Thos. Washington."

2. The department by its letter No. 9047-1219-4 of July 12, 1922, decided as follows:

"1. Authority contained in decision of the department of May 14, 1919 (9047-1219), to pay enlisted personnel a subsistence allowance while absent on leave granted while patient in hospital, etc., is revoked, effective immediately. (Signed) R. E. Coontz, acting."

3. In accordance with the direction of the department as quoted in the foregoing paragraph, no further "so-called sick leave" as mentioned in this correspondence will be granted at naval hospitals on and after the date of the receipt of this letter; such leaves already granted will not be extended; but such leaves already in force when this letter shall be received may be completed.

E. R. STITT.

[1st indorsement.]

WSG/T. 125949 (54).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 3, 1922.

To: Secretary of the Navy.

Via: Bureau of Navigation.

Subject: Subsistence of enlisted personnel of the Navy and Marine Corps (Regular and Reserve) during period granted leave from treatment in hospital.

Reference: (a) Opinion of Judge Advocate General, No. 9047-1219, May 14, 1919; (b) letter of Acting Secretary, No. 9047-1219, May 14, 1919; (c) letter of Secretary, No. 9047-1219-2, June 26, 1919; (d) Acting Secretary's letter to Navigation, No. 26254-2883-2, October 30, 1919; (e) this bureau's letter

to all naval hospitals, No. 125949 (63), June 25, 1919; (f) Supplies and Accounts preceding indorsement No. 82-5-E, May 31, 1922.

1. The granting of so-called "sick leave" referred to in the attached papers and in the several references was primarily for the convenience of the Government while the Navy, including the Marine Corps, was expanded much beyond the available naval hospital facilities. By sending selected cases to their homes for the period of convalescence, the bureau was able to release beds for more serious cases and to avoid rental of beds in civilian hospitals; it was also granted, secondarily, for the purpose of hastening convalescence through change of environment.

2. The scope of this authority was further extended to include the sick attached to naval vessels by the department's letter to the Bureau of Navigation (ref. d) of October 30, 1919.

3. This bureau concurs with the Bureau of Supplies and Accounts in the opinion that the practice in question should be terminated, but suggests that instructions to that effect be made effective on June 30, 1922, in order that the new fiscal year may not be involved.

4. To avoid complications, directions should be given that no further so-called sick leaves, as mentioned, may be granted; that leaves already granted may not be extended; but that leaves now in force may be completed.

5. If authorized by the department, the bureau will issue instructions to the above effect to all naval hospitals only.

E. R. STITT.

Circular letter, serial No. 201—1922.

WJCA:ESK. 132687-0 (73).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 21, 1922.

To: All naval hospitals.

Subject: Modification of circular letter, Serial 189—1922.

Reference: (a) Bureau of Medicine and Surgery circular letter WJCA:ESK, 132687-0(54), serial No. 189—1922, of May 22, 1922.

1. You are directed to change paragraph 5, reference (a), to read as follows:

"5. All articles made by Veterans' Bureau patients from material supplied by the Bureau of Medicine and Surgery will be held pending legislation regarding their disposal, and information concerning this will be supplied in a subsequent circular letter." (This paragraph in no way applies to articles made by Veterans' Bureau patients from supplies and materials furnished by the Red Cross Society.)

And to add paragraph 6 as follows:

"6. The Bureau of Medicine and Surgery has no objection to Veterans' Bureau patients receiving occupational therapy training from the American Red Cross personnel at naval hospitals under the same conditions as now apply to naval personnel."

E. R. STITT.

Circular letter, serial No. 202—1922.

HBS/MPS. 132679 (81).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 3, 1922.

To: All medical officers.

Subject: Bottles issued to the Naval Service labeled sodium bicarbonate but found to contain monohydrated sodium carbonate.

1. Purchase of a quantity of sodium bicarbonate from the McKesson & Robbins Co., New York, during June, 1919, was made by the commanding officer, naval medical supply depot, Brooklyn, N. Y. This particular consignment, lot No. 2694-5A, has been found to contain monohydrated sodium carbonate. Medical officers are therefore directed to examine carefully all such bottles before issue. Monohydrated sodium carbonate may be distinguished from sodium bicarbonate as a free-flowing granular crystalline substance instead of a nonflowing palpable powder.

2. So far as can be determined, the above-mentioned lot was issued to the service during the summer and fall of 1921.

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 203-1922.

WSG/T. 132697-0 (81).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 3, 1922.

To: All naval hospitals.

Subject: Bed capacity; Veterans' Bureau and Navy.

Reference: (a) Veterans' Bureau letter (ADH-Fac-6-MSS), July 14, 1922 (No. 129733-63); (b) this bureau's letter No. 132687-0 (72), July 12, 1922, to the nine naval hospitals involved only; (c) this bureau's circular letter No. 132687-0 (61), June 5, 1922 (serial No. 193-1922).

1. In the bureau's above-mentioned letters, statements were made of the number of beds to be reserved during the fiscal year 1923 for Veterans' Bureau patients and (ref. b) the number to be reserved for naval personnel.

2. By a more recent arrangement with the Veterans' Bureau (ref. a) of a reduced number of reserved beds (1,650 instead of 2,150) and because of the reduction in the enlisted force of the Navy to 86,000 men, it is directed that at the hospitals mentioned beds be reserved as follows:

Hospital.	Veterans' Bureau patients.	Navy patients.	Total.
Portsmouth, N. H.....	50	100	150
Chelsea, Mass.....	350	200	550
Newport, R. I.....	50	300	350
New York, N. Y.....	400	488	888
League Island, Pa.....	125	466	591
Washington, D. C.....	150	150	300
Norfolk, Va.....	100	700	800
Pensacola, Fla.....	25	99	124
Great Lakes, Ill.....	350	100	450

3. To economically administer these hospitals, it is directed that beds in excess of the number shown in the column "Total" above shall be considered, and reported as beds "Out of commission but available for emergency expansion;" all temporary buildings not required in maintaining the numbers of beds above mentioned will be dismantled, so far as necessary, and closed, but will be so left as to permit of being placed in service on short notice; the supply of water, steam, and electricity will be disconnected where and when practicable, due consideration being given to the fire hazard, and no other repairs will be made than those absolutely necessary for the preservation of the buildings.

4. As the arrangement with the Veterans' Bureau (ref. a) contemplates "50 beds which may be utilized from time to time in naval hospitals where a definite quota of beds has not been established," naval hospitals, other than those mentioned in paragraph 2 above, are directed to admit Veterans' Bureau patients in emergencies, and to notify this bureau of all such admissions.

F. L. PLEADWELL, *Acting.*

N65-JPI-BL 31847-29.

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
Washington, D. C., July 14, 1922.

BUREAU MANUAL CIRCULAR NO. 5.

From: Bureau of Navigation.

To: All ships and stations.

Subject: Injury or death of persons in the Naval Service, information concerning.

1. The following changes in Bureau of Navigation manual are approved and directed to be made upon receipt of this letter:

Add the following articles:

"D-8413. *Information concerning injury or death of persons in the Naval Service.*—The bureau is in receipt of numerous letters from relatives of deceased or injured persons requesting detailed information concerning the death or injury of the individuals concerned.

"D-8414. In all cases of death and in cases of accident involving serious injury to any person in the Naval Service, commanding officers will, as soon as possible, acquaint the next of kin with all the circumstances connected therewith, so far as definitely known. The communication (telegram or letter) should be in such detail and in such language as to show personal consideration for the next of kin, an accomplishment which can not but react favorably to the Naval Establishment. (See Art. D-8411 for reports to department.)

"D-8415. Care shall be exercised to see that the information given is not at variance with the findings of any court or board which may have been convened in the premises."

R. H. LEIGH, *Acting.*

Circular letter, serial No. 204-1922.

RFJ-LMT SD 132687-0(81).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 7, 1922.

To: Commanding officer, U. S. S. —.

Subject: Educational material dealing with the prevention and control of accidents and disease.

1. There are forwarded herewith a set of posters dealing with the prevention and control of accidents and disease which have been approved by the commanders in chief of the Atlantic and Pacific Fleets. It is requested that these posters be displayed on bulletin boards in such manner as the commanding officer sees fit. Additional posters will be forwarded to your ship at approximately monthly intervals. In accordance with the suggestion of the commander in chief of the Pacific Fleet it is thought best that the posters dealing

with the control of venereal disease be displayed in such places that they will not be conspicuous to visitors coming aboard ship.

2. The Bureau of Medicine and Surgery is forwarding to the commanders in chief of the Atlantic and Pacific Fleets a 12-reel motion-picture film entitled "The Science of Life," which may be obtained by individual ships from their respective commander in chief. Copies of this motion picture have also been forwarded to the commanding officer, United States naval training station, Hampton Roads, and the commanding officer, United States naval training station, San Francisco. As soon as possible this motion picture will be forwarded to the commander in chief of the Asiatic Station.

3. The Bureau of Medicine and Surgery has had made lantern slides dealing with the prevention and control of accidents and disease which will be furnished to any ship or station making request for the same. Samples of the lantern slides have been furnished the commanders in chief of the fleets.

4. Comment or criticism of the posters now being forwarded by the Bureau of Medicine and Surgery to ships and stations is desired; and if the officers or men of the ships or stations can suggest types of posters for use throughout the service in the prevention and control of accidents and disease, the bureau will have such material printed and distributed.

E. R. STITT.

Circular letter, serial No. 205-1922.

WRJ:THC 124716(82).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 11, 1922.

To: All naval hospitals and hospital ships.

Subject: Ration memoranda—Hospital Form No. 36.

References: (a) Hospital Form No. 52, Nurse Corps subsistence report.

(b) Hospital Form No. 53, Hospital Corps subsistence report.

(c) Bureau's circular letter No. 129733(54), serial No. 47-1920, of July 20, 1920.

(d) Bureau's circular letter No. 129733(54), serial No. 63-1920, of October 22, 1920.

(e) Bureau's circular letter No. 132685, serial No. 129-1921, of October 11, 1921.

(f) Bureau's circular letter No. 125884(22), serial No. 163-1922, of February 11, 1922.

Inclosures: (1) Ration memoranda—Hospital Form No. 36.

1. Hospital Forms Nos. 52 and 53, statements of subsistence of Nurse Corps and Hospital Corps, respectively—(refs. (a) and (b))—will be discontinued, and these numbers will be given to other forms about to be instituted.

2. Instructions contained in paragraph 6 of reference (c) and paragraph 5 of reference (d) are hereby revoked and quarterly report required under said letters discontinued.

3. In lieu of the tabular statement required by paragraph 5, reference (d), a report will be made on the "report of expenditure card" and paragraph 15 of reference (f) will be amplified by adding, as subparagraph (h), the following:

"(h) 'Report of expenditure cards' covering expenditures for care of the dead will show, in the case of Veterans' Bureau patients, the name of the deceased, date of death, place of burial, and itemized cost."

4. Reports submitted under reference (c), "Care of supernumerary patients during fiscal year," will be discontinued.

5. In lieu of the reports required by reference (a), "Nurse Corps subsistence report," (b) "Hospital Corps subsistence report," (c) "Report of Veterans' Bureau patients," and (e) "Care of supernumerary patients," it is directed that, beginning with the month of July, 1922, each hospital and hospital ship submit Form No. 36, "Ration memoranda," prepared in the manner outlined on inclosure.

6. Hospital ships will report only the personnel subsisted by "naval hospital fund."

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 206-1922.

WJCA: ESK 129733(74).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 7, 1922.

To: All naval hospitals.

Subject: Monthly report of United States Veterans' Bureau beneficiaries in United States naval hospitals.

Reference: (a) Letter to the Surgeon General, United States Navy, from the Assistant Director, United States Veterans' Bureau No. ADH-fac-6-MSS of 28 July, 1922.

1. For your information there is quoted herewith the first paragraph of reference (a):

"In order that the United States Veterans' Bureau may be kept more adequately informed in regard to the current hospital situation in naval hospitals, it is respectfully requested that there be prepared each month and transmitted to this bureau, attention medical statistical section, a report by individual hospitals of the number of admissions of United States Veterans' Bureau beneficiaries classified by tuberculosis, neuropsychiatric, and general diseases; the total number of discharges, unclassified as to type of disease, but separating deaths from discharges; and the total number of patient days of treatment rendered at each hospital, unclassified."

2. You are directed to forward on the first of each month, on forms similar to the accompanying form, original report direct to the United States Veterans' Bureau, attention medical statistical section, and a duplicate report direct to the Bureau of Medicine and Surgery. The copy forwarded to this bureau should be marked "Copy for the Bureau of Medicine and Surgery."

3. These forms will not be furnished by the bureau and should be prepared by the hospitals. Reports covering the month of July, 1922, should be submitted immediately.

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 207-1922.

HBS/DRG 132609-0(72).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 16, 1922.

To: All medical officers.

Subject: Surveyed medical department property recommended by survey board for disposition by "G. S. K." (supply officer).

1. When a survey of property of the Medical Department which recommends certain items to "G. S. K." (supply officer) "for final disposition," has been approved by this bureau and copy returned to activity concerned, a separate

list of items thereon recommended for disposition by supply officer will be prepared by the survey board on Form Ca-1 sheets, with the following signed note appended:

"Above items Nos. xxxx recommended to be turned over to supply officer for sale to highest bidder.

"(Signed) -----"

2. The commanding officer will forward above list to supply officer, together with instructions that the recommendation of the survey board, as approved by the bureau, be complied with.

E. R. STITT.

Circular letter, serial No. 208-1922.

FLP-DRG 124920-O(83).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 17, 1922.

To: All medical officers.

Subject: Arsphenamine; administration of, on board ship forbidden and stock on hand to be turned in.

Reference: (a) Bu. M. & S. circular letter No. 44-1920 of July 10, 1920.

1. Attention is called to reference (a) (quoted below), which has not been rescinded or modified:

To: All medical officers.

Subject: Arsphenamine and neoarsphenamine.

1. The following letter of Rear Admiral E. R. Stitt, Medical Corps, United States Navy, is approved by the bureau and published for the information of the medical officers of the United States naval service:

" July 7, 1920.

"To: Bureau of Medicine and Surgery.

" Subject: Recommendation that neoarsphenamine be substituted for arsphenamine in connection with use on board ships and at certain stations of the Navy.

"1. I would recommend that the use of arsphenamine be discontinued on board ships of the Navy and in its place to substitute neoarsphenamine. This same recommendation would apply to stations and smaller hospitals.

"2. In the larger hospitals, where facilities for the administration of arsphenamine are satisfactory, the choice between arsphenamine and neoarsphenamine should be left to the discretion of the commanding officer.

"3. This recommendation is made for the following reasons:

"(a) In discussing fully this matter with the director of the hygienic laboratory he is of the opinion that most of the accidents attending the use of arsphenamine have been connected with errors in technic. In view of the simplicity of technic when using neoarsphenamine, many untoward results would be eliminated.

"(b) In the clinic of the Brady Institute, neoarsphenamine is used exclusively, and Doctor Young and his associates are unable to note any lessened therapeutic efficiency with this drug than when arsphenamine is used.

" E. R. STITT."

2. The commanding officers of the United States naval medical supply depots will be instructed to include neoarsphenamine on the supply table and requisitions on Form 4 will be filled at the supply depots.

3. Requisitions from the larger hospitals will be approved for either arsphenamine or neoarsphenamine as the commanding officers prefer, but it is recommended that commanding officers of the larger hospitals continue to requisition arsphenamine until the present supply is exhausted.

W. C. BRAISTED.

2. In connection with the bureau's circular letter quoted above, it appears that the medical departments of some ships are still carrying both arsphenamine and neoarsphenamine. It has come to the attention of the bureau recently that an instance of the accidental use of arsphenamine occurred under an impression on the part of the medical officer that he was using neoarsphenamine, with serious results. This confusion of one variety of arsphenamine with the other has in some instances been enhanced by the similarity of labels on the containers, but steps have been taken by the manufacturers to differentiate more carefully the two varieties by distinctive labels.

3. Since the instructions contained in the bureau's circular letter No. 44-1920 contemplated that only one variety of arsphenamine should be maintained in stock on ships, stations, and smaller hospitals in order to avoid the difficulties referred to in paragraph 2, it is directed that all arsphenamine now in stock in the medical stores of all ships, stations, and smaller hospitals be immediately returned to the nearest naval medical supply depot. It is further directed that in medical departments of hospitals where both varieties of arsphenamine are retained in stock care be taken to differentiate sufficiently the two varieties so that no confusion can result in selecting the appropriate technic for the variety intended to be used.

4. No. 31, volume 37, Public Health Reports, dated August 4, 1922, contains "standard instructions for the preparation and intravenous administration of arsphenamine and neoarsphenamine for use by the Medical Departments of the Army, of the Navy, and of the Veterans' Bureau, and by the Public Health Service." These instructions should be followed.

E. R. STITT.

Circular letter, serial No. 209-1922.

DCC:SMS 128586(84).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 21, 1922.

To: All naval hospitals.

Subject: Retention of patients in naval hospitals.

References: (a) Section 22, Veterans' Bureau act of August 9, 1921 (42 Stat. 155).

(b) Circular letter 109-1921, July 11, 1921, 128586(72).

1. Reference (b) is hereby canceled.

2. Reference (a) states: "Sec. 315. That no person admitted into the military or naval forces of the United States after six months from the passage of this amendatory act shall be entitled to the compensation or any other benefits or privileges provided under the provisions of Article III of the war risk insurance act, as amended."

The Judge Advocate General (28510-1481) commenting on this provision states: "In view of the foregoing, you are advised that as the law now stands enlisted men entering the service either in a first enlistment or through a reenlistment since February 9, 1922, do not come within the purview of the

Veterans' Bureau act or within the provisions of the pension laws unless their rights under said pension laws accrued prior to October 6, 1917."

3. In view of the above-quoted law and decision of the Judge Advocate General, this bureau feels that it is incumbent upon it to retain for a reasonable period those members of the personnel who enlisted after February 9, 1922, especially until Congress passes some measures for their relief. This applies particularly to cases of tuberculosis and other diseases where the patient will require institutional treatment if he were discharged.

4. It is requested that persons so retained be surveyed after each three months and that the board of medical survey state the necessity for their retention. If the person surveyed desires to be discharged from the service, he should be informed of his status and that fact stated on the medical survey form recommending his discharge from the service. In the case of persons reenlisting after February 9, 1922, who are surveyed for disease or disability occurring after their reenlistment, the survey board should state the relation, if any, between the present disability and their service subsequent to October 6, 1917.

5. The bureau does not desire the retention of persons whose disability is discovered soon after enlistment, if "not in line of duty," and who are able to care for themselves if discharged.

6. Patients who enlisted prior to February 9, 1922, should be surveyed, recommended for discharge from the service, and retained as supernumeraries until taken up by the Veterans' Bureau.

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 210-1922.

DCC: SMS 128586 (84).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 22, 1922.

To: All naval hospitals.

Subject: Tuberculosis patients who have enlisted subsequent to February 9, 1922.

Reference: (a) Circular letter 127-1921 (128586) (101) of October 10, 1921.

1. Reference (a) is hereby canceled.

2. In order to prevent the transfer of tuberculosis patients to the Fitzsimons General Hospital, Denver, Colo., who will not be benefited by the treatment there, it is requested that the following instructions be observed:

(a) Only patients who have a positive sputum diagnosis will be transferred to the Fitzsimons General Hospital, Denver, Colo.

(b) Of those mentioned in paragraph (a), only those who in the opinion of the board of medical survey will be benefited by the high, dry atmosphere of Colorado.

(c) Those patients whose sputum is negative for tubercle bacilli will be retained for treatment.

3. The bureau expects the cooperation of the commanding officers of the various naval hospitals in observing the above instructions, as it appears to be the opinion of many specialists in the treatment of tuberculosis that tubercular patients can be satisfactorily treated in a general hospital.

4. Paragraphs 4, 5, and 6 of circular letter serial No. 209-1922, 128586(84), August 21, 1922, apply to cases of tuberculosis.

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 211-1922.

WRJ:THC 124842(84).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., August 24, 1922.

To: All medical officers.

Subject: Blank forms.

1. Hereafter blank forms will be issued to the service at a cost value and will be accounted for on the "report of expenditures" in the same manner as are other supplies issued from the naval medical supply depot.

2. Requests for blank forms, Forms "O" and "41," will be prepared and submitted in duplicate. The duplicate copy will be priced by the medical supply depot and returned, with the forms supplied, for the information of the activity.

3. It has been brought to the attention of the bureau that blank forms are requested by the various activities in quantities far in excess of actual requirements, sometimes in such amounts as to require rail shipments. It is directed that care be exercised in preparing such requests and forms requested in quantities only as may be shipped by mail.

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 212-1922.

WHM-HCM SDS 124842(91).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 1, 1922.

To: All medical officers.

Subject: Re the reporting of disabilities occurring among naval personnel attached to and actually serving on submarines.

1. It is directed that in the future when personnel attached to and actually serving on board submarines are admitted to the sick list all submarine bases, tenders, and other stations to which submarines are attached will, on line 10 of Form F card, add after the name of the particular base, tender, or station the name of the submarine in parentheses, e. g., Submarine base (U. S. S. *Ortolan*), San Pedro, Calif. (U. S. S. *L-6*).

2. The cases will, however, be reported in the usual manner on Forms F and K, the above designation appearing only on Form F cards.

F. L. PLEADWELL, *Acting.*

Circular letter, serial No. 213-1922.

WSG:ESK 125884(64).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 7, 1922.

To: All naval hospitals.

Subject: Navy property not to be loaned.

Reference: S. & A. "Memoranda," No. 239, July 1, 1922, page 6454.

1. The following letter from the Acting Secretary of the Navy to the Chief of the Bureau of Supplies and Accounts, dated June 28, 1922, is quoted for the information and guidance of all concerned:

"Confirming oral instructions, Government property in the custody of the Navy shall not be lent to anyone or any organization, public or private, except

by express authority of the Secretary of the Navy transmitted through the Paymaster General.

"Such items of material as the Secretary of the Navy considers legal to issue to governmental, humanitarian, and boy scout organizations, or organizations of a corresponding philanthropic nature, shall not be issued as loans, but shall be sold to such organizations at a price fixed by the Paymaster General, subject to the approval of the Secretary of the Navy. In the case of special articles, such as boats, engines, and ordnance matériel, the Paymaster General will refer the matter to the bureau concerned before presenting his recommendation to the Secretary of the Navy."

2. Especial attention is invited to the above order and to the fact that no loans of Government property may be made "except by express authority of the Secretary of the Navy."

3. The alleged loan of Medical Department tentage has recently been unofficially brought to the bureau's attention.

E. R. STITT.

Circular letter, serial No. 40-22.

N-14-RRME-KVS 55390-79.

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
Washington, D. C., August 24, 1922.

To: All ships and stations.

Subject: Activities of the American Red Cross for the benefit of Navy personnel.

Inclosures: Two.

1. There are attached inclosures (2), two papers which indicate clearly the work The American Red Cross is constantly performing for the benefit of the personnel of the Navy.

2. It is directed that these inclosures be brought to the attention of the personnel in order that they may know and appreciate the very large amount of work the American Red Cross is constantly performing for the benefit of themselves and their families.

THOMAS WASHINGTON.

[Inclosure 1.]

RED CROSS ACTIVITIES FOR UNITED STATES NAVAL PERSONNEL.

JULY 25, 1922.

The national headquarters American Red Cross maintains in their organization a department called the bureau of naval affairs, to which a medical officer of the Navy is regularly assigned and detailed. Through this office all correspondence from the Red Cross chapters concerning naval personnel, ex-Navy men, and families of naval men is routed. Through this office matters pertaining to emergencies arising in families, financial affairs, etc., can be taken up immediately with the proper authorities in the Navy Department and information furnished the local chapters.

The Red Cross activities in naval hospitals are as follows:

- (a) Providing supplemental entertainment for patients. (This consists of motion pictures, vaudeville shows, dances, etc.)
- (b) Regular visiting (under commanding officer's direction).
- (c) Stimulating in adjacent community welfare activities which can be beneficial to the patients.

During the World War and subsequent demobilization the Red Cross activities at naval stations and bases were very helpful to the Navy and were greatly appreciated. At the present time Red Cross personnel under the direction of a field director is maintained at each naval station and large marine post, where valuable services, especially in connection with the home service conditions and contact between an enlisted man and his family, etc., are rendered.

The social service department of the Red Cross in relation to Veterans' Bureau patients in naval hospitals has to do with—

(a) Securing social histories and other significant data for use of tuberculosis specialists and psychiatrists.

(b) Securing reports on home conditions for help of physicians in deciding whether or not to discharge a patient to his home.

(c) Correspondence with home communities to adjust home situations, thereby making it possible for patients to remain in hospitals. This sometimes involves financial aid to families.

(d) Arranging through local communities for men who return home to have proper care and assistance in adjusting themselves to civilian life.

(e) The Red Cross maintains an information service which deals with—

(1) Communicating with family doctors and others to assist in securing affidavits necessary to substantiate Government claims.

(2) Information to families regarding patients' personal and family affairs when advised to do so by the commanding officer.

(3) Furnishing information to patients regarding Government legislation.

(4) Furnishing information regarding Government insurance.

(f) The Red Cross also assists in the matter of following up Veterans' Bureau patients who leave the hospitals A. W. O. L. or against advice to see that they return, or if leaving against advice that they are placed under proper supervision in a home community.

The Red Cross maintains Red Cross convalescent houses at each of the large naval hospitals where patients may avail themselves of the opportunity to read, play such games as their physical condition permits, write letters, etc.

The Red Cross has accomplished a great deal in filing with the proper offices information and data necessary for Veterans' Bureau patients to receive compensation from the bureau. There are at present nearly 800 Veterans' Bureau patients in naval hospitals, a large number of whose claims for compensation have not been settled. Through the investigations by the Red Cross and data furnished settlement of these claims is greatly expedited.

The Red Cross Society maintains in practically all of the large naval hospitals personnel to instruct the patients in occupational therapy. This consists of bead work, basketry, weaving, metal work, toy making, etc. (These departments are practically self-supporting.)

One of the most commendable works of the Red Cross for naval, marine, and Veterans' Bureau patients in naval hospitals is to keep their families advised as to their condition, and to help, often financially, to make arrangements for parents to visit their sons whose conditions are critical.

[Inclosure 2.]

REPORT OF SERVICE RENDERED BY AMERICAN RED CROSS FOR MEN OF THE NAVY AND MARINE CORPS, INCLUDING VETERANS' BUREAU PATIENTS IN NAVAL HOSPITALS, DURING THE MONTH OF JUNE, 1922.

I. Men in camps and stations last day of month:

(a) Number of stations covered.....	26
(b) Approximate number of able-bodied men served.....	75,565
(c) Approximate number of service patients served.....	3,635
(d) Approximate number of Veterans' Bureau patients served	1,946

II. Record cases:

1. Brought forward from preceding month.....	3,135
2. New record cases.....	2,188
3. Reopened record cases.....	789
4. Total open during month.....	6,112
5. Cases acted on during month.....	3,864
6. Closed during month	3,274
7. Remaining open at end of month.....	2,838

III. Analysis of new and reopened record cases:

1. Soldier and sailor claims (allotment, allowance, insurance, compensation, etc.)	945
2. Other difficulties regarding Government's program.....	250
3. Investigations—	
(a) Discharge.....	137
(b) Furlough.....	61
(c) A. W. O. L. or A. O. L.....	64
(d) Medical, social.....	322
(e) Other, social.....	374
4. Requests for family service—	
(a) Relief.....	118
(b) Social.....	173
5. Connections with relatives reestablished.....	115
6. Men's other personal problems (preparing affidavits, obtaining needed clothing; miscellaneous friendly aid; legal; business problems, etc.)	659
7. Number men given loans during month.....	149

IV. Nonrecord (individual information cases involving elements listed in Group III)

5,852

V. Hospital recreation and entertainment conducted or produced by the American Red Cross for patients in Navy hospitals:

1. Motion-picture shows	28
Approximate attendance.....	4,050
2. Vaudeville and plays.....	14
Approximate attendance.....	3,950
3. Speaking and musicals.....	15
Approximate attendance.....	1,125
4. Athletic events.....	16
Approximate attendance.....	450
5. Miscellaneous (dances, outings, card parties, etc.)	28
Approximate attendance.....	3,198

VI. Services to patients (not elsewhere specified) :

1. Friendly visits to patients.....	8, 519
2. Number of instances of definite services rendered patients...	2, 728
3. Letters written by hospital worker—	
(a) Communication service.....	669
(b) Personal	339

VII. Supplies distributed for comfort and welfare of patients in hospitals includes a variety of items. A few of those articles distributed generally throughout all divisions are listed below :

Brushes, tooth	170
Cards, playing	76
Cigarettes	35, 400
Cream, shaving.....tubes.....	90
Envelopes	11, 240
Matches.....books.....	650
Matches.....cartons.....	6
Paper, writing.....	16, 950
Socks.....pairs.....	112
Sweaters	104
Tooth paste.....tubes.....	141

Circular letter.
Serial No. 214—1922.

HWS: WAL 125221(93).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 15, 1922.

To: All medical officers.

Subject: Preliminary examination of applicants for aviation training.

Reference: Bureau of Navigation Manual, 1921, page 60, paragraph C-33.

1. The following instructions are issued to define the scope of the preliminary examination of applicants for aviation training required by the above reference. It is to be noted that these instructions are supplementary to those contained in chapter 11, Manual of the Medical Department, 1917, which will remain in force until the (new) Manual, 1922, is issued. Upon receipt of the new Manual these instructions will lapse and the procedure described therein will be followed by all medical officers so far as may be possible with apparatus at hand.

2. *Eye examination.*—

(a) Any gross defect of the eyes or lids, squint, or any condition tending to progress that may impair vision later on will disqualify and must be recorded.

(b) Vision: 20/20 vision is demanded. No applicant will be accepted whose vision does not come up to this standard. Visual acuity will be tested in the usual manner in a good light and with the test types free from dirt. In case a letter or letters in any line is misread it may be offset by reading the same number of letters in the next smaller line. The best possible vision will be recorded by noting the number of the line read plus the number of letters correctly read in the next smaller line, thus: 20/20+3; 15/20+1.

(c) Color vision: Each eye will be tested separately while the other is covered with a suitable shield. If any hesitation or confusion is apparent, the test must be checked by the confusion skeins or other suitable color test. No defect in color vision will be waived and any existing defect must be recorded.

(d) *Spontaneous nystagmus*: Spontaneous nystagmus will be tested by having the applicant hold his head still, face forward, while following the examiner's finger with his eyes in the following directions: Right, right and down, down, down and left, left, left and up, up, up and right. Nystagmus in any except the extreme positions will disqualify and will be recorded.

3. *Ear examination*.—

(a) Record any abnormality of the ears or defect in hearing. Both tympanic membranes must be seen clearly when examined, so that an accurate record may be made. Permanent blocking of either canal or a diseased condition that may impair hearing later on will be recorded. Perforation, inflammation, evidence of past inflammation, irreducible retraction of a membrane, or the presence of pus will be recorded.

(b) *Hearing*: Hearing will be tested as follows:

(1) *Watch test*: A loud-ticking watch that has been standardized on three people with normal ears will be used. The result will be recorded as 40/40, or a fraction thereof, as 28/40.

(2) *Coin-click test*: The applicant, with his back turned, will stand 20 feet from the examiner in a quiet room. The examiner will hold a coin between the thumb and forefinger of either hand, and while an assistant closes one ear of the applicant will click the coins softly together and require the applicant to tell the number of clicks. If the applicant is unable to hear the clicks at a distance of 20 feet, the examiner will approach slowly until the clicks are heard. Each ear will be tested in turn and the result recorded as 20/20 or a fraction thereof.

4. *Past history*.—A careful examination will be made into the past history of an applicant; with especial attention given to the following points, and record made of any found:

Syphilis.

Repeated attacks of hay fever or asthma.

Recent attacks of malaria.

Paroxysmal tachycardia.

Organic heart disease.

Golter.

Nervous or mental disease in his own family or collateral branches.

5. *Height and weight*.—Height and weight will correspond to the standard set in chapter 11 of the Manual for the Medical Department, with slight variations allowable at the discretion of the bureau. The height shall be not less than 64 inches. The weight shall not be less than 120 nor more than 200 pounds. The applicant must be well proportioned and active.

6. *Pulse and blood pressure*.—The pulse rate and blood pressure will be taken after the applicant has reclined five minutes, and recorded. He will then be required to stand for two minutes and another record made of pulse rate and blood pressure. The difference between reclining and standing pulse rates should not exceed 35. A marked drop in blood pressure from reclining to standing will cause rejection. In no case should the blood pressure exceed 145 mm. Hg., and where the applicant is under 25 years of age it should not exceed 135 mm. Hg. The diastolic blood pressure is roughly two-thirds of the systolic. If the first examination indicates a high blood pressure, the applicant will be examined twice daily (morning and afternoon) until his normal is determined.

7. *Urine analysis*.—A urine analysis will be made in each case. The presence of albumen, sugar, or casts will disqualify unless three clear specimens can be obtained on successive days.

E. R. STITT.

Circular letter.
Serial No. 215—1922.

DCC: SMS 128586(92).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 16, 1922.

To: All naval hospitals.

Subject: Medical surveys in the case of enlisted men, United States Navy, with more than 12 but less than 16 years' service and more than 25 years' service.

Reference: (a) Act of Congress, July 1, 1922.

(b) Decision of the Judge Advocate General, dated August 29, 1922.

1. Paragraphs (13) and (14) of reference (b) are quoted for your information.

"13. Applying these decisions to the provisions under consideration, this office is of the opinion that the beneficial character of these statutes is such as to exclude discharges from the naval service except by sentence of a court-martial in the cases of enlisted men who had not less than 25 years' service to their credit on July 1, 1922, and enlisted men who had to their credit more than 12 years' but less than 16 years' service on that date.

"14. Answering more especially the question presented, you are advised that in the opinion of this office enlisted men in the Navy who had to their credit on July 1, 1922, more than 12 years' but less than 16 years' service shall be permitted to reenlist and to continue serving until they are eligible for transfer to the Fleet Naval Reserve after 16 years' service without reference to their physical or other qualifications."

2. In view of the above decision of the Judge Advocate General, it is requested that naval enlisted men with more than 12 but less than 16 years' service and more than 25 years' service on July 1, 1922, be not surveyed and recommended for discharge from the service. If it is deemed advisable to have a medical survey in these cases, it is recommended that it be held for record only.

3. Where the patient himself desires discharge from the service, and does not wish to remain in the service until his 16 or 30 years' service have been completed, he should be requested to make formal application, over his own signature, to the Secretary of the Navy to that effect.

4. It is understood that this decision does not apply to the United States Marine Corps.

E. R. STITT.

Circular letter.
Serial No. 216—1922.

DCC: SMS 124680(93).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 16, 1922.

To: All naval medical officers.

Subject: Health record.

1. This bureau has prepared for issue a revised health record.

2. The duplicate descriptive sheet (carbon copy to be forwarded to the bureau) has been left out, as the sheets can not be promptly filed owing to lack of clerical force.

3. The outline figure charts have been replaced, as the written description by different medical officers of the same man do not, in many instances, agree as to locality of marks and scars.

4. The abstract of medical history has been revised, so that the dates of admission and discharge for disease or injury may be entered for the reference of future medical officers who may treat the man.

5. Attention is called to the fact that this bureau has to conduct considerable correspondence because medical officers do not enter in the health record a note or admission for minor disabilities when they occur. Slight deafness, due to gunfire, slight sprains, and other minor injuries which do not cause marked disability at the time are often the bases of claims for compensation or pension, and the man may lose the claim because there is no entry in his health record, unless the medical officer, probably years later, can recall the disability. In order to more definitely establish claim for pension or compensation, these cases should be admitted for record and the origin stated.

6. It is particularly desirable that defects noted at enlistment be recorded. Surveys received in the bureau shortly after enlistment show that many men are enlisted without a close examination by the medical officer, e. g., perforated eardrums with purulent discharge, old fractures with adherent scars, amblyopia, etc.—conditions which are manifest on careful examination.

7. The bureau desires to call attention to the large number of skeleton records received with only the man's name and rate and the words "skeleton record" written across the face of the descriptive sheet. Attention is called to paragraphs 7 and 10 of the instructions on the cover of the health record.

8. Medical officers are again requested to make a concise statement as to the reasons for assigning the origin of a disability, especially when the entry is "not in line of duty." Much correspondence could be avoided if attention is given to this matter.

9. The attention of medical officers on recruiting duty is called to the fact that the Manual for the Medical Department should be followed in examining recruits, in order that there may be uniformity in examinations throughout the recruiting service.

10. The instructions printed on the cover of the health record should be carefully followed in regard to the use, care, and disposal of the health record.

E. R. STITT.

Circular letter.
Serial No. 217—1922.

PSR-RM 127039(93).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 16, 1922.

To: District medical officers, naval districts; commanding officers, naval hospitals; medical officers, recruiting stations.

Subject: Vacancies in Naval Medical Corps.

1. The constantly increasing shortage of medical officers is becoming a serious menace to the efficiency of Medical Department activities, and it becomes necessary to make extraordinary efforts to secure suitable candidates for entrance into the corps.

2. To this end it is desired that commanding officers of naval hospitals, medical officers detailed to recruiting duty, and particularly district medical officers, make an effort to get in touch with recent graduates of Class A medical schools and those about to vacate internships in civil hospitals, with a view to presenting to those of suitable type the advantages offered by a commission in the Naval Medical Corps and to secure sufficient applicants to fill the present vacancies in the corps, which will amount to approximately 40.

3. Those interested should be directed to make application direct to the Bureau of Medicine and Surgery either for further information or for authority to take the entrance examination, which will be arranged at the nearest naval hospital or navy yard.

4. This matter is one of vital interest to the welfare of the corps, and while it is desired that officers to whom this circular is addressed make special efforts along these lines, it is also desired that all medical officers interest themselves in the subject and endeavor, wherever suitable, to interest young men who would make desirable additions to the corps.

E. R. STITT.

Circular letter.
Serial No. 218—1922.

HWS:MFD 125561(93).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 22, 1922.

To: All medical officers.

Subject: Venereal prophylaxis.

Reference: (a) Medicine and Surgery circular letter, serial No. 158—1922.

(b) U. S. Naval Medical Bulletin, March, 1922, pages 604-605.

1. The bureau desiring to obtain at the earliest possible moment reliable information that would serve to indicate the efficacy of self-administered prophylaxis as now largely practised, medical officers are directed to submit any statistics or other data that would aid the bureau in ascertaining the precise value of this method.

2. In this connection, medical officers are urged to instruct the personnel adequately in the application of this prophylactic method and to make clear the importance of the time element and other factors influencing its effectiveness.

E. R. STITT.

Circular letter.
Serial No. 219—1922.

WSG:ESK 127401(94).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., September 28, 1922.

To: All naval hospitals.

Subject: "Navy Day."

References: (a) Letters of Secretary of the Navy 3909-1124, September 12, and 3909-1124-3, of September 22, 1922.

(b) Bureau's letter 127401(92) of September 20, 1922, to naval hospitals within continental limits.

Inclosures: Secretary's letters (reference a).

1. The inclosed letters are forwarded for your information, and particular attention is invited to paragraph 2 of the first inclosure.

E. R. STITT.

Circular letter.

WSD/JBC 124677-O.

Serial No. 220—1922.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., October 7, 1922.

To: All naval hospitals (continental limits), naval submarine base, New London, Conn.; naval submarine base, San Pedro, Calif.; sick quarters, marine barracks, Quantico, Va.

Subject: Care of the dead; supervision over work of contract undertaker.

Reference: (a) Article 1841 Navy Regulations.

(b) M. and S. circular letter, serial No. 181—1922, No. 129504(44), April 24, 1922.

1. Several complaints recently have come to the bureau regarding the condition of bodies prepared by civilian undertakers under contract with naval hospitals. Investigation of the complaints leads to the belief that a more careful supervision over the undertaker's work may be necessary to safeguard the interests of the Government and of the relatives of the deceased.

2. To this end, it is desired that the inspection by a medical officer prescribed by article 1841(4), Navy Regulations, shall be sufficiently thorough to determine that the entire body has been reached and saturated by the embalming fluid. If practicable, there should be two inspections; the first after embalming has been completed, but before the body has been clothed, as to the efficacy of the embalming process; the second, after the body has been clothed and encased, as to general appearance, completeness, correctness, and condition of uniform and clothing, position in casket, and condition of casket.

3. All persons concerned in care and disposal of the remains of the dead should be required to familiarize themselves with the instructions contained in the above-mentioned circular letter regarding embalming and preparation of remains, which will assist them in determining the condition of the body. Particular attention should be given to those parts enumerated in the circular letter as less likely to be preserved by the arterial injection.

4. In no instance should a body be released for shipment until the inspecting officer is satisfied it is so preserved that it may be reasonably expected to reach its destination in proper condition, and that the clothing and encasement are in accordance with Navy Regulations and the terms of the contract. Whenever necessary, the body should be held for repeated attention until its condition is satisfactory, as it is better that there should be complaints regarding delays in shipment than of faulty embalming or improper encasement. If for any unusual reasons, such as long immersion in cases of drowning, or where the body has reached the undertaker after long delay, satisfactory results can not be obtained, the relatives should be informed of the circumstances in advance, and the casket should be sealed and plainly marked "Not to be opened."

5. While it is not intended that the contract undertaker shall be compelled to follow the technique of the circular letter, it is apparent that in preparing bodies for shipment there should be some modification of the process usually employed when burial is to be made locally. The undertaker will therefore be required to use such additional measures as may be necessary to insure arrival of the body in condition to be viewed.

E. R. STITT.

Circular letter.
Serial No. 221—1922.

WSD/JBC 124677-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., October 12, 1922.

To: All naval hospitals; naval unit, Fitzsimons General Hospital, Denver, Colo.
Subject: Disposal of remains of retired enlisted men of the Marine Corps who die in naval hospitals.

Reference: (a) M. and S. circular letter, serial No. 152—1921, No. 124677-O (123), December 22, 1921.

(b) Letter from headquarters, Marine Corps, No. 28937, October 6, 1922.

1. The following communication (reference b) has been received from Marine headquarters:

"It has been brought to the attention of this office in several cases where retired enlisted men of the Marine Corps have died in naval hospitals that the remains have been turned over to relatives or other interested parties for interment. Payment of the necessary burial expenses involved has caused considerable correspondence in the claims for reimbursement for reasonable amounts in such cases. In order to avoid controversy with the Comptroller General's Office it is suggested that, if practicable, in the future all contracts made for the burial of enlisted men of the Navy and Marine Corps on the active list be so worded as to include retired enlisted men of the Marine Corps, in view of the fact that such provision is made in the appropriation for the maintenance of the Quartermaster's Department of the Marine Corps yearly."

2. The appropriation under "Maintenance, Quartermaster's Department, Marine Corps," to which reference is made reads as follows: "*Contingent, Marine Corps. For * * * funeral expenses of officers and enlisted men, and retired officers on active duty during the war and retired enlisted men of the Marine Corps, including transportation of bodies and their arms and wearing apparel from the place of demise to the homes of the deceased in the United States; * * **"

3. In accordance with the above, the remains of *retired enlisted men of the Marine Corps* who die in naval hospitals will be prepared, encased, and buried, or shipped to their homes in the United States, at Government expense, as a charge against the above-mentioned appropriation. One additional requisition will be immediately submitted by the hospital, covering the balance of the current fiscal year (and thereafter yearly), in terms similar to the following example, providing both for local interment and shipment of the remains of deceased enlisted men of the Marine Corps. The expenditures under this requisition will be made chargeable against "Maintenance, Quartermaster's Department, Marine Corps."

EXAMPLE.

1. For the preparation and burial of the remains of retired enlisted men of the Marine Corps during the fiscal year ending June 30, 1923, including preparation of remains, embalming, encasement (casket and outside box), health department permit, etc., hearse and two seven-passenger automobiles for transportation to the cemetery, and opening and closing of grave.

2. For all services, etc., included in item No. 1, except that casket and outside box will be furnished by the Government.

3. For the preparation of the remains of retired enlisted men of the Marine Corps for shipment to their homes during the fiscal year ending June 30, 1923,

including preparation of remains, embalming, hermetical encasement (including inside shell, metallic casket, and shipping box, all complete), health department permit, etc., and delivery to shipping point.

4. For all services, etc., included in item No. 3, except that Navy standard hermetical casket and shipping box will be furnished by the Government.

Services to be rendered promptly upon receipt of notification, and all services rendered and material supplied to be of a kind and character satisfactory to the commanding officer.

NOTE.—It will be advisable for purposes of practical administration to make award under this requisition to the undertaker now holding contract under hospital requisition Nos. ——— and ———, provided his terms are not in excess of his contracts for exactly similar work under the requisition just mentioned.

4. According to the statement of Marine Headquarters, no allotment of funds will be required.

5. All other provisions of reference (a) remain in effect.

E. R. STITT.

Circular letter.
Serial No. 222-1922.

GHR VH 132679(101).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 19 October, 1922.

To: All medical and dental officers.

Subject: Supply table. Increase in allowance of towels and operating gowns for use in dental offices.

1. An increase of six operating gowns and eighty-four towels has been added to the allowance on pages 46 and 47 of the supply table for the use of dental officers, and the naval medical supply depot has been instructed to honor requisitions for twelve gowns and one hundred twenty towels.

E. R. STITT.

Circular letter.
Serial No. 223-1922.

GHR VH 124842(104).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 23 October, 1922.

To: All naval dental officers, via official channels.

Subject: Dental Form K reports.

1. It has been noted that dental officers have been recording temporary fillings of cement and gutta-percha in the spaces below the record for permanent fillings on Form K Dental.

2. As no record is kept at this bureau of fillings of a temporary nature, it is requested that the practice of recording them on Form K Dental be discontinued.

E. R. STITT.

Circular letter.
Serial No. 224-1922.

AWD-VH-125884(104).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 24 October, 1922.

From: Chief of the Bureau of Medicine and Surgery.
To: All naval hospitals (continental limits).
Subject: Foodstuff expended during the fiscal year 1922.

1. It is directed that each hospital submit to the bureau an itemized total of all foodstuff expended during the last fiscal year. These totals to be compiled from the twelve monthly totals of the commissary ledger. This statement to show the *quantity* of each item, cost not to be considered or reported.

2. Also give the total number of subsistence days for the fiscal year 1922.

E. R. STITT.

Circular letter.
Serial No. 225-1922.

WWB EGM P 13 42022

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., October 24, 1922.

To: All medical officers.
Subject: Hospital Corps situation.

1. The Hospital Corps situation is acute and rapidly becoming more so. A shortage of 720 men exists to-day, and the bureau is faced with an additional loss, by expiration of enlistment alone, of 460 prior to 1 January, 1923. The percentage of reenlistments is small, and it is necessary that all officers put forth special efforts to persuade desirable trained men to reenlist, to extend their enlistment, and to be examined for advancement in rating.

2. The following table shows the excess and shortage in ratings other than chief pharmacist's mates:

Rating.	Shortage.	Excess.
Ph. M. 1c.....	342	.....
Ph. M. 2c.....	362	.....
Ph. M. 3c.....	382	.....
H. A. 1c.....	.....	177
H. A. 2c.....	.....	116

There are excellent prospects for the advancement of candidates for the above petty officer ratings shortly after their names are placed on the eligible list in the Bureau of Navigation, and all men who meet the requirements of Bureau of Navigation circular letter 12-22 of 28 March, 1922, and, in the opinion of the medical officer with whom they are serving, are qualified for and deserving of advancement, should be encouraged and urged to take the examinations as prescribed in articles D-4332, 4383 (1) (2) and (3) Bureau of Navigation Manual.

3. The Bureau of Medicine and Surgery will give consideration to requests made for change of duty contingent upon extension of enlistment or reenlistment, and if possible will recommend favorable action. Men desiring duty in the Tropics or on the Asiatic station (including Guam and Samoa) must

have at least 1½ or 2 years to serve, respectively, after leaving the United States to be eligible for such duty.

4. The Bureau of Medicine and Surgery believes that additional effort and cooperation on the part of all officers relative to reenlistment or extension of enlistment and examination for advancement will improve the morale of the Hospital Corps and measurably lessen the difficulties facing the Bureau. It should be remembered that it is impossible to fill all ratings in complements when shortages exist as at present.

E. R. STITT.

WSG:ESK 132687-O(94).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 15 November, 1922.

To: All naval hospitals.

Subject: Menus, etc., for Thanksgiving and Christmas dinners.

References: (a) This Bureau's letter to Supplies and Accounts 132687(94), 11/4/22.

(b) Supplies and Accounts 1st endorsement 402-24-J/182-5, 11/8/22.

(c) Navigation's 2nd endorsement 772-649, 11/11/22.

1. The expenses for the procurement of menus for the general mess at naval hospitals may be defrayed from funds allotted to naval hospitals from the appropriation "Recreation for enlisted men."

2. The present allotments will be expected to cover this expense, which it is understood has been in some instances heretofore defrayed from outside sources.

E. R. STITT.

WSG:ESK 132687-O.

16 NOVEMBER, 1922.

To: All naval hospitals.

Subject: Envelopes and general schedule of supplies.

Enclosures: (a) "Award of contracts for envelopes," 1923.

(b) "General schedule of supplies," 1923.

1. The above-mentioned publications are being forwarded by separate enclosure.

2. In preparing requisitions for envelopes and other supplies, listed, item numbers, subnumbers, and letters, designating the exact supplies should be used, and reference should always be made to "Award of contracts for envelopes, 1923," or to "General schedule of supplies, 1923," as the case may be.

E. R. STITT.

Circular letter.

Serial No. 226-1922.

WJCA/v 12 9733(112)

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., November 11, 1922.

To: All naval hospitals (within continental limits of the United States).

Subject: Index of Veterans' Bureau publications, etc.

Enclosure: (1) Index referred to in subject of this letter.

1. The accompanying enclosure is a cross index of Veterans' Bureau publications, including general orders, field orders, regulations, etc.; also of Medicine and Surgery circular letters pertaining to Veterans' Bureau activities.

58448-23-11

2. This index is complete to date and is forwarded with a view of facilitating necessary references to Veterans' Bureau publications, etc.

3. You are requested to check up this index with the Veterans' Bureau publications and Medicine and Surgery circular letters pertaining to Veterans' Bureau activities on file at the hospital under your command and to notify this bureau of missing publications. All missing publications will be forwarded upon receipt of request indicating which ones are required.

4. You are requested to cross-index, in accordance with the accompanying enclosure, all future publications pertaining to Veterans' Bureau activities which may be received.

5. This index was compiled from information obtained from the central office, U. S. Veterans' Bureau, and does not include the local district Veterans' Bureau regulations.

E. R. STITT.

INDEX.

A.

Absent without official leave:

1. Patients absent for a period of twenty-four hours or longer shall be subject to the following disciplinary action upon return to the hospital:

- (a) Withholding of pass privileges.
- (b) Confinement to grounds of the hospital.
- (c) Withholding special privileges.
- (d) Or such other reasonable and customary methods of punishment as may be in force in that particular institution.
- (e) Repeated absence without leave may properly result in referring the case to a board of officers, who may recommend forfeitures or discharge, or both. (See Veterans' Bureau G. O. No. 27-A.)

2. When a patient is absent for twenty-four hours the district manager shall be promptly notified. (See Veterans' Bureau G. O. No. 27-A.)

3. A patient absent for seven days shall be reported to the director and district manager as having been discharged. Report to be made on Form No. 1873. (See Veterans' Bureau G. O. No. 27-A.)

Admission of all classes of cases from the Veterans' Bureau. (See Bureau M. & S. circular letter 97-1921.)

Admission of patients:

1. Two copies of report cards (in-patient), Form 1971-F, will be executed upon admission in addition to copy retained at the hospital. One of the copies to be forwarded to the manager of the district and one direct to the Veterans' Bureau. (See Bureau M. & S. circular letter 190-1922.)

2. Cards will be forwarded in a manila envelope obtained from the Veterans' Bureau by requisition. Two cards as noted above. All envelopes, which should always bear the name of the forwarding station, will be numbered consecutively, beginning at one, and will be marked thus, "Cards 1971-F Package No. —." All envelopes will be addressed to:

The Director.

Attention Medical Statistics Section,

U. S. Veterans' Bureau, Washington, D. C.

(See Vet. Bu. Hosp. section circular No. 2; Bureau M. & S. circular letter 190-1922.)

Admission of patients—Continued.

3. No patient discharged from a hospital for disciplinary reasons will be admitted to a hospital until a period of three months has elapsed since discharge. (See Veterans' Bureau G. O. No. 27-A.)
4. For second offense, a period of six months shall elapse before the patient will be readmitted. (See Veterans' Bureau G. O. No. 27-A.)
5. A patient may be rehospitalized after being "Discharged against medical advice" by the district manager in which the hospital is located. If he appears outside of that district, permission must be obtained from the director. (See Veterans' Bureau G. O. No. 27-A.)
6. Every patient of the U. S. Veterans' Bureau should receive a register number upon admission to the hospital. This number should be retained by the patient until discharged, and it should appear on all records of the patient during the period in hospital, particularly admission and disposition cards. The register number of U. S. V. B. patients should be assigned consecutively from one district series for each hospital. Only one number will be assigned to each patient during one continuous hospitalization. A new register should be assigned upon readmission of a patient. The numbers should be carried on indefinitely. (See Bureau M. & S. circular letter 190-1922.)

Application of person disabled in and discharged from service:

This form will be used when application for compensation, insurance benefit, or vocational training is requested: Form No. 526. (See Veterans' Bureau G. O. No. 5.)

B.

Bed capacity for Veterans' Bureau cases. (See Bureau M. & S. circular letters 193-&-203-1922.)

Burial in national cemetery (see "Funeral expense"):

Unclaimed bodies of Veterans' Bureau patients shall be buried in national cemeteries. (See Veterans' Bureau G. O. Nos. 67 & 127.)

C.**Certificates of illness:**

Certificates of illness may be furnished Veterans' Bureau cases. (See Bureau M. & S. circular letter 174-1922.)

Charges for disciplinary board. (See "Disciplinary boards"; see Veterans' Bureau G. O. No. 27-A.)**Compensation:**

Request for will be submitted on Veterans' Bureau Form No. 526. (See Veterans' Bureau G. O. No. 5.)

Contact representative:

Appointment of a contact representative in hospitals caring for 100 or more Veterans' Bureau patients. (See Veterans' Bureau G. O. 132.)

Convening orders for disciplinary boards. (See "Disciplinary boards.")**Cooperating:**

Officers of the Veterans' Bureau in their official capacity will be permitted access at all hospitals where beneficiaries of the Veterans' Bureau are being treated. With a view (a) to acquaint the hospital authorities with the general aim and policies of the bureau; (b) to ascertain character of professional treatment; (c) to cooperate with commanding officer in the investigation of complaints made to the bureau. (See Veterans' Bureau, G. O. No. 23.)

D.

Daily report of patient turnover:

Veterans' Bureau G. O. No. 90 may be construed to mean that a daily report may be necessary from hospitals in order that the daily report of the district office be complete. (See Veterans' Bureau G. O. No. 90.)

Dead: (See "Transportation, dead"; "Funeral expenses"; "Burial in national cemeteries"; War Risk Regulations No. 33.)

When a Veterans' Bureau patient dies in a hospital three (3) copies of Form N shall be prepared and forwarded to the district. (See Bureau M. & S. circular letter No. 73-1921.)

Telegram to be sent to next of kin. Form to be used. (See Bureau M. & S. circular letter No. 73-1921.)

Dental work:

1. Dental claims and fee table for treatment by designated dental examiners. (See Veterans' Bureau Regulations Nos. 17, 17-A, & 17-B.)
2. Dental examinations and treatment. (See Veterans' Bureau G. O. Nos. 45 & 45-A.)
3. Claimants of the Veterans' Bureau in naval hospitals shall receive dental care as naval patients. (See Bureau M. & S. circular letter 122-1921.)

Discharge of patients:

1. Two copies of report cards, Form No. 1971-F will be executed upon discharge in addition to copy retained at the hospital. One of the copies to be forwarded to the manager of the district and one direct to the Veterans' Bureau. Cards will be forwarded as directed under "Admission of patient." (See Bureau M. & S. circular letter 190-1922.)
2. Transportation of patients discharged from hospitals. (See "Transportation of patients.")
3. Discharge of dissatisfied hospitalized patients. (See "Dissatisfied patients.")
4. Notice of discharge of patient for disciplinary reasons shall contain a statement as to need of further hospitalization. (See Veterans' Bureau Field Order No. 19.)
5. Forward Veterans' Bureau Form No. 2545 in triplicate.
6. Upon discharge from the hospital the patient shall be examined by the hospital authorities and a report submitted in duplicate to the district manager. (See Veterans' Bureau G. O. No. 26.)
7. If a patient is ready for discharge from a hospital and object to such discharge, the commanding officer shall appoint a board to examine the man. A written report in duplicate shall be submitted, and when approved by the commanding officer, forwarded with appropriate comments to the assistant director of the Medical Division. (See Veterans' Bureau G. O. No. 26.)
8. When a claimant is to be discharged from a hospital, further treatment being unnecessary, it shall be determined if he is eligible for training. If such be the case he shall not be discharged from the hospital until after all arrangements have been made for such training, if desired by the claimant. (See Veterans' Bureau G. O. No. 26-A.)
9. If a patient completes his treatment after being rehospitalized for "Discharge against medical advice," he shall receive transportation to his home. (See Veterans' Bureau G. O. No. 27-B.)

Discharge of patients—Continued.

10. Patients discharged as noted in the preceding reference shall be the subject of a special report to the district manager and the Medical Division of the Veterans' Bureau, calling attention to the fact that this discharge comes within the provisions of G. O. No. 27-A, Section IV, par. 4. (See Veterans' Bureau G. O. No. 27-A.)
11. If a patient completes his treatment after being rehospitalized for "discharge, disciplinary," he will be given transportation to his home, and such discharge will be the subject of a report as outlined in the above reference 9. (See Veterans' Bureau G. O. No. 27-A.)

Discharge of patient "absent without leave":

1. A patient absent for a period of seven days will be dropped from the rolls of the hospital and reported on Form No. 1873 to the district manager and director. (See Veterans' Bureau G. O. No. 27-A.)
2. An insane patient removed from the hospital by his family or guardian without authority from the commanding officer will be handled as in cases of "patient leaving without official leave." (See Veterans' Bureau G. O. No. 27-A.)

Discharge of patients "against medical advice":

1. Patients discharged against medical advice for the first time will be given transportation to their homes or as outlined in B. W. R. F. O. No. 20, see "transportation of patients." (See Veterans' Bureau G. O. No. 27-A.)
2. Patient leaving hospital against medical advice will not be given transportation or expenses to another hospital. (See Veterans' Bureau G. O. No. 27-A.)
3. Should a patient on his second hospitalization again be discharged against medical advice, he will not be entitled to transportation or other expenses on discharge. (See Veterans' Bureau G. O. No. 27-A.)
4. When a patient is discharged against medical advice, the same shall be reported on V. B. Form No. 1873. (See Veterans' Bureau G. O. No. 27-A.)
5. When a patient is discharged against medical advice, a board of medical officers shall investigate the same, and report in duplicate will be prepared, and not until approved by the commanding officer shall the man be discharged. (See Veterans' Bureau G. O. No. 27-A.)

Disciplinary boards:

1. Charges, specifications, convening orders, and form of procedure dealing with actions under Veterans' Bureau General Order No. 27-A. (See Veterans' Bureau G. O. No. 32.)
2. Board will be governed by the customary procedure of Government boards. Shall consist of two medical officers of the staff and one member appointed by the district manager. (See Veterans' Bureau G. O. No. 27-A.)

Disciplinary discharge:

1. Notice of such discharge shall contain a statement as to need of further hospitalization. (See Veterans' Bureau Field Order No. 19.)
2. Disciplinary discharges should not be carried into effect when such procedure would work injury to the patient. Rather than discharge such cases it is suggested that the disciplinary board take advantage of G. O. No. 27-A, which provides for a fine of a part of the claimant's compensation. (See V. B. Hospital Section Circular No. 53.)

Disciplinary discharge—Continued.

3. A man discharged for disciplinary reasons shall not be admitted again until three months has elapsed since discharge. (See Veterans' Bureau G. O. No. 27-A.)
4. For second offense, a period of six months shall elapse. (See Veterans' Bureau G. O. No. 27-A.)
5. A patient discharged for disciplinary reasons will be given transportation to his home or place from which hospitalized. See "Transportation of patients." (See Veterans' Bureau G. O. No. 27-A.)
6. Patients will not be discharged for disciplinary reasons when the following conditions exist:
 - (a) No patient who is mentally irresponsible shall be discharged for disciplinary reasons.
 - (b) No patient shall be discharged for disciplinary reasons if his physical condition is such as to endanger his life by reason of such discharge.
 - (c) No patient will be discharged for disciplinary reasons except on the recommendation of a board of officers, approved by the commanding officer.
(See Veterans' Bureau G. O. No. 27-A.)
7. Upon the second or subsequent discharge of AWOL or for disciplinary reasons, the Board of Officers may recommend forfeiture of compensation up to a maximum of 75 per cent each month for a period of three months. (See Veterans' Bureau G. O. No. 27-A.)
8. If recommendations as outlined above have been approved by the commanding officer, he shall inform the man that he has a right to appeal and will do so within three days in writing to the commanding officer, who will forward the appeal to the district manager of the district. (See Veterans' Bureau G. O. No. 27-A.)
9. Whenever a patient is discharged for disciplinary reasons or disciplined by forfeiture of compensation, Form No. 1874 shall be prepared in triplicate. One copy retained, one sent to the manager of the district, and one to the Hospital Section, Medical Division, Veterans' Bureau. In each instance a copy of the board proceedings will accompany Form 1874. (See Veterans' Bureau G. O. 27-A & 27-B.)

Disciplinary regulations. See Veterans' Bureau G. O. No. 27-A; "Absent without official leave"; "Disciplinary Boards"; "Disciplinary discharge"; "Discharge of patient, against medical advice"; "Discharge of patient, absent without official leave"; "Discharge of patients."

Dissatisfied patient:

1. If a patient leaves the hospital against the advice of the medical officer, the district office and the bureau in Washington shall be notified. Record of same shall be recorded in the hospital record. Patient shall be informed that he will not be given transportation to return to the hospital. If dissatisfaction is due to treatment and it is believed that some other hospital may be able to handle the case to the benefit of the patient, the medical officer shall request the district officer to transfer the man. If transfer is not recommended by the medical officer, he shall so state. (See Veterans' Bureau Field Order No. 7.)

District offices:

Fourteen district offices established and designating the territory each covers. (See Veterans' Bureau G. O. No. 3.)

Domiciliary cases:

Shall be transferred to a soldiers' home. (See Bureau M. & S. circular letter 167-1922.)

E.**Error in claim for compensation:**

May be reopened when evidence of error is submitted. (See War Risk G. O. No. 84.)

F.**Forms of procedure for disciplinary boards. (See "Disciplinary Boards.")****Funeral expenses:**

1. The sum of \$100.00 shall be available for the funeral expenses; also cost of an attendant to accompany remains and the cost of transportation. (See War Risk Regulations No. 58.)
2. Destitute patients or trainees may be buried in a national cemetery, provided:
 - (a) Expenses as outlined above are not exceeded.
 - (b) Such burial is desired by next of kin.
 - (c) Permission from proper authority has been obtained.
 - (d) If inmate of service or contract hospital at time of death.

Bill shall be submitted under two heads, viz: Funeral expense and transportation and incidental expense. (See Veterans' Bureau Regulations No. 58.)

3. Funeral expenses for veterans of the Spanish-American War, Philippine insurrection, and Boxer rebellion will not be paid by the Veterans' Bureau, but he may be buried in a national cemetery if authority is granted; otherwise the body will be disposed of by the local health authorities if not claimed by the next of kin. (See Veterans' Bureau Regulations No. 30.)

Forfeiture of compensation:

1. Upon the second or subsequent discharge for AWOL or for disciplinary reasons, the board of officers may recommend forfeiture of compensation up to a maximum of 75 per cent each month for a period of three months. (See Veterans' Bureau G. O. No. 27-A.)
2. If recommendations as outlined above have been approved by the commanding officer, he shall inform the man that he has a right to appeal, and will do so within three days, in writing, to the commanding officer, who will forward the appeal to the district manager of the district. (See Veterans' Bureau G. O. No. 27-A.)
3. When a patient has been discharged for disciplinary reasons and the board has recommended forfeiture of compensation, the hospital shall submit a report of physical examination and report of the findings of the board of officers. Both reports shall be forwarded in duplicate. Submit Form Nos. 1873 and 1874. (See Veterans' Bureau G. O. No. 27-A.)
4. If patient does not appeal, report of action taken shall be submitted on Form No. 1874 and sent to the district manager. (See Veterans' Bureau G. O. No. 27-A.)

Forfeiture of compensation—Continued.

5. In the cases of patients who have committed an offense, and where it is not deemed necessary to recommend their discharge, a board of officers may recommend a forfeiture of compensation up to a maximum of 75 per cent each month for a period of three months. The following will be performed in connection with the above: Submit Form No. 1874; (a) inform patient of right to appeal and that he shall submit written report within three days; (b) inform district manager by telegram of the approved recommendation of the board; (c) copy of telegram to be mailed to the central office. (See Veterans' Bureau G. O. No. 27-A.)
6. When an appeal is made, a certain form shall be signed by the patient involved. (See M. & S. circular letter 170-1922.)

H.**Hospital admission card Form No. 1971-D:**

Card shall bear the following notation: "Not valid after ten days from date of issuance." (See Veterans' Bureau Field Order No. 36.)

I.**In-patient report card No. 1971-F:**

Shall be forwarded in duplicate as outlined under "Admission of patient" and "Discharge of patient." (See Bureau M. & S. circular letter No. 190-1922.)

Insane:

An insane person removed from the hospital by his family or guardian without the authority of the commanding officer will be handled as "Absent without official leave." (See Veterans' Bureau G. O. No. 27-A.)

Inspections:

Instructions for district medical inspectors. (See Veterans' Bureau Field Order No. 29; Veterans' Bureau G. O. Nos. 39 and 89A.)

M.**Monthly report to Veterans' Bureau:**

1. A monthly report shall be forwarded to the Veterans' Bureau setting forth the number of transactions in Veterans' Bureau cases; form to be used. (See Bureau M. & S. circular letter 206-1922.)
2. A monthly report of occupational therapy activities shall be forwarded. One copy shall be forwarded direct to the Bureau of Medicine and Surgery. (See Bureau M. & S. letter 129733(104), of October 24, 1922.)

O.**Oaths:**

Authority of officers of the Army and Navy to administer oaths concerning Veterans' Bureau patients. (War Risk Bulletin No. 84.)

Occupational therapy:

1. Views of the Veterans' Bureau as regards the use and successful application of this mode of treatment. (See hospital section circular Nos. 30 and 30-A.)

Occupational therapy—Continued.

2. Naval Hospital will furnish their own equipment and personnel for the application of this treatment. (See Veterans' Bureau G. O. No. 68-A.)
3. Occupational therapy includes any occupation, mental or physical, that will hasten recovery from disease or injury. It includes the old term "prevocational training." (See Veterans' Bureau G. O. No. 68-A.)
4. A monthly report of occupational therapy activities shall be forwarded. One copy shall be forwarded direct to the Bureau of Medicine and Surgery. (See Bureau M. & S. letter 129733(104), of October 24, 1922.)
5. Policy of the Bureau of M. & S. as regards the handling of this work. (See Bureau M. & S., circular letter 189-1922.)
6. All articles made by V. B. patients from material supplied by the Bureau of Medicine and Surgery will be held pending legislation regarding their disposal. (See Bureau M. & S. circular letter 201-1922.)

P.

Patients, transfer of, to other hospitals. (See "Transfer of patients to other hospitals.")

Physiotherapy:

1. Equipment for its application will be furnished by the Navy. Personnel for its application will also be furnished. (See Veterans' Bureau G. O. No. 68-A.)

Prosthetic appliances:

1. Rules relative to the furnishing of prosthetic appliances, repairs, and renewals of the same to claimants of the Veterans' Bureau. (See Veterans' Bureau Regulations Nos. 7, 7-A, & 7-B.)

R.**Refusing treatment:**

1. Action to be taken. (See Bureau M. & S. circular letter 166-1922.)

Relation of the Veterans' Bureau to Navy and contract hospitals. (See Veterans' Bureau Field Order No. 43.)

Requisitions for supplies:

1. Procedure in requisitioning supplies, equipment, and blank forms. (See Veterans' Bureau Field Order No. 43.)

Reopening of cases:

1. Cases may be reopened when error in the original has been discovered. (See War Risk G. O. No. 84.)

S.

Sale of by-products of authorized activities of vocational training. (See Veterans' Bureau Regulations No. 29.)

Specifications for disciplinary boards. (See "Disciplinary boards.")

Standard of requirements for hospitals. (See Veterans' Bureau G. O. No. 28.)

Total disability:

1. Rules for determining the same. (See Veterans' Bureau Regulations Nos. 4 & 4-A.)

T.

Trainees:

1. Trainees who take sick while under training will be given hospital treatment. (See Bureau M. & S. circular letter 160—1922.)

Transfer of patients to other hospitals:

1. Medical officers in charge of hospitals will recommend a climatic change for patients only when a sufficient medical reason exists for such transfer. All recommendations for transfer will be forwarded on Medical Form No. 1899. (See Veterans' Bureau hospital section circular No. 8.)

Transportation of dead:

1. Remains will be sent to the former home of the deceased upon request of the next of kin, and expense will be paid by the Veterans' Bureau. (See War Risk Regulations No. 33.)
2. When remains of a Veterans' Bureau patient is transported by Government bill of lading, the following notation shall appear thereon: "Transportation under this bill of lading are payable by the U. S. Veterans' Bureau, Washington, D. C., in accordance with Bureau of War Risk Insurance letter dated October 16, 1920." (See Bureau M. & S. circular letter 154—1922.)

Transportation of patients:

1. When a discharged patient requests transportation to a place other than that from which transportation was furnished when the patient was originally admitted to the hospital, such shall be his bona fide residence and if necessary the claim that his address has been changed should be supported by affidavits from two disinterested parties. (See War Risk Field Order No. 20.)
2. Patients discharged against medical advice for the first time will be given transportation to their homes. (See Veterans' Bureau G. O. No. 27-A.)
3. Claimants and beneficiaries are entitled to the following: (a) Report to a medical officer for an authorized medical examination; (b) transfer to a service or contract hospital; (c) report back to their homes when treatment or observation is complete. Exceptions: Cases coming under V. B. G. O. No. 27-A. (See Veterans' Bureau Regulations Nos. 16 & 16-A.)
4. Veterans' Bureau will not pay for transportation of veterans of the Spanish-American War, etc. (See Veterans' Bureau G. O. No. 30.)
5. Patients leaving a hospital against medical advice will not be given transportation to another hospital. (See Veterans' Bureau G. O. No. 27-A.)
6. A patient who has completed his treatment after being rehospitalized for discharge against medical advice shall be given transportation to his home. (See Veterans' Bureau G. O. No. 27-A.)
7. Should a patient on his second hospitalization again be discharged against medical advice, he will not be entitled to transportation on discharge. (See Veterans' Bureau G. O. No. 27-A.)
8. A patient who has been discharged for disciplinary reasons will be given transportation to his home or place from which hospitalized. (See Veterans' Bureau G. O. No. 27-A.)

Transportation of patients—Continued.

9. A patient who has been discharged for disciplinary reasons will not be given transportation back to the hospital if rehospitalization has been authorized. (See Veterans' Bureau G. O. No. 27-A.)
10. A patient discharged upon completion of treatment after being rehospitalized from disciplinary discharge will be given transportation to his home. (See Veterans' Bureau G. O. No. 27-A.)
11. A patient discharged for AWOL, who was rehospitalized after disciplinary discharge, will not be entitled to transportation to or from a hospital afterwards. (See Veterans' Bureau G. O. No. 27-A.)
12. Transportation to homes of Veterans' Bureau patients will be furnished even when mileage is furnished by the Navy. (See Bureau M. & S. circular letter 146—1921.)

V.**Veterans of Spanish-American War, Philippine Insurrection, and Boxer Rebellion:**

1. May be treated by hospitals under the Veterans' Bureau. (See Veterans' Bureau Regulations No. 80; "Funeral expenses.")
- Vocational schools. (See Veterans' Bureau G. O. No. 78, 78-A, 78-B, & 78-C.)
- Vocational training:
1. Request for shall be submitted on Form No. 528. (See Veterans' Bureau G. O. No. 5.)
 2. Sale of by-products. (See Veterans' Bureau Regulations No. 29.)

W.**Weekly report of Veterans' Bureau patients:**

1. Shall be sent by telegram and contain certain information. (See Veterans' Bureau M. & S. circular letter 156—1921.)
2. Working details for Veterans' Bureau patients. (See Bureau M. & S. circular letter 100—1921.)

Circular letter.
Serial No. 227-1922.

WJCA: ESK 129733(113).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 15 November, 1922.

To: All naval hospitals within the continental limits of the United States.
Subject: Instructions regarding U. S. Veterans' Bureau physio-therapy Forms 1603, 2581, and 1606.

Enclosures: (a) Instruction sheet.

(b) U. S. V. B. Medical Division Form 1603.

1. You are directed to comply with the instructions contained in the accompanying enclosures.
2. It is understood that the physio-therapy forms referred to will be forwarded by the U. S. Veterans' Bureau direct to naval hospitals.

3. In compiling U. S. V. B. Medical Division Form 1603, in column 1, under "Names and dates of duty of aides and assistants," you are directed to make a statement to the effect that physio-therapy work in naval hospitals is conducted by members of the Medical Corps, Nurse Corps, and Hospital Corps, and in the following columns to give only the total number of treatments: Such as: Massage, 10; electro-therapy, 15; hydro-therapy, 25; thermo-therapy, 10; exercise, 20; total, 80; average daily treatments, 7, etc.

4. In naval hospitals where physio-therapy aides are employed Form 1603 will be filled out as indicated, together with the statement referred to in paragraph 3.

5. Information called for on the forms referred to above applies only to beneficiaries of the U. S. Veterans' Bureau, and no information concerning physio-therapy administered to naval or patients other than beneficiaries of the Veterans' Bureau will be included in these reports.

E. R. STITT.

Circular letter.

Serial No. 228-1922.

WJCA:ESK 129733(104).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 27 November, 1922.

To: All naval hospitals within the continental limits of the United States.

Subject: Monthly reports of occupational therapy from U. S. naval hospitals caring for Veterans' Bureau cases.

References:(a) Bureau of Medicine and Surgery letter WJCA:ESK 129733 (104) of 24 October, 1922.

(b) Circular letter, serial number 186-1922, of 16 May, 1922.

(c) Circular letter, serial number 196-1922, of 29 June, 1922, WJCA:ESK 129733 (64).

Enclosures: (1) U. S. Veterans' Bureau report of occupational therapy activities.

1. Reference (a), addressed to commanding officers of several of the naval hospitals, is hereby canceled and future reference to the subject of this letter should refer to this circular letter.

2. References (b) and (c) and any other instructions regarding the forwarding of reports about occupational therapy to the U. S. Veterans' Bureau or to this bureau are hereby canceled.

3. You are directed to comply with instructions as outlined in the accompanying inclosure, and to modify them in such a manner that an additional copy of this monthly report marked "Copy for the Bureau of Medicine and Surgery" is to be forwarded directly to this bureau.

4. It will be seen that to compile these reports it will be necessary to obtain certain information from the Red Cross occupational aids and from the educational aids employed by the Bureau of Medicine and Surgery.

5. This report refers only to beneficiaries of the U. S. Veterans' Bureau. Similar reports on naval personnel are not required.

E. R. STITT.

United States Veterans' Bureau, Medical Division.

Date:_____

REPORT OF OCCUPATIONAL THERAPY ACTIVITIES FOR MONTH OF _____

Station _____

(Street and number.) (Street.) (City.) (State.)

To: The Director, U. S. Veterans' Bureau, Washington, D. C.

(Attention P., T. & O. T. subsection, hospital subdivision.)

1. Name.	2. Days worked.	3. O. T. in shop or on farm.	4. O. T. in class and in wards.	5. O. T. hours.	6. No. of patients.	7. Total hours.
Total.....						

SUMMARY.

	Hos- pital.	Occupational therapy.					Total.
		On wards.		Off wards.			
		Text.	Craft.	Class- rooms.	Shops.	Farm.	
(a) USVB beneficiaries in, 1st day of month.....							
(b) New admissions during month.....							
(c) Total in, for the month.....							
(d) Number in, discontinued during month.....							
(e) Number in, last of month.....							
(f) Number of hours in.....							
(g) Total occupational therapy personnel for month.....							
(h) Occupational therapy directors.....							
(i) Occupational therapy instructors.....							
(j) Occupational therapy aides.....							
(k) Assistant aides.....							
(l) Stenographers.....							
(m) Other personnel.....							

In Charge of Occupational Therapy.

Approved and forwarded:

Medical Officer in Charge.

Med. 1870—Rev. Aug., 1922.

Circular letter.
Serial No. 229-1922.

WJCA : ESK 129733 (113).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 28 November, 1922.

To: All naval hospitals within the continental limits of the United States.

Subject: Instructions regarding reports of physio-therapy and occupational therapy treatments to beneficiaries of the United States Veterans' Bureau.

References: (a) Letter from Director, U. S. Veterans' Bureau BWC/s/10, P. & O. T. hospital subdivision of November 20, 1922.

(b) Bureau of Medicine and Surgery circular letter serial No. 227-1922, WJCA : ESK 129733(113), of November 15, 1922.

(c) Bureau of Medicine and Surgery circular letter WJCA : ESK 129733(104), of November 27, 1922, serial No. 228-1922.

1. The contents of reference (a) is quoted herewith for your information :

"Referring to forms for monthly reports of physio-therapy and occupational therapy treatments given to beneficiaries of this bureau, you are advised that it is found necessary, because of certain changes in the administration of the work, to make definite modifications in the forms from those which were approved by a board of representatives from the various services, which met last spring.

"In respect to Form Med. 1870-Rev., it is suggested that the information called for in columns 1, 2, 3, 4, 5, 6, and 7 need not be included in reports from your hospitals, so far as the Veterans' Bureau is concerned. There is, however, no objection to these columns being filled in if the information is desired by your office. The date, name, and address of the station, with the 'Summary,' will be all that will be required on this form by the bureau for statistical purposes.

"On Form 1603 the 'Names and days of duty of aids and assistants,' with the 'Number of treatments,' given by each, may be omitted; also the use of Forms 2614-M, 2614-D, 2581, 2592, and 1606 is optional with you. That is, all the reports desired by the Veterans' Bureau is a summary of the number of Veterans' Bureau patients in each hospital, with the number of those taking physio-therapy and occupational therapy, and the number of treatments or occupied hours."

2. The Bureau of Medicine and Surgery does not require the information called for in columns 1, 2, 3, 4, 5, 6, and 7, Form Med. 1870-Rev., referred to in paragraph 2 of reference (a).

3. Attention is invited to the last sentence of paragraph 3 of reference (a).

4. You are directed to forward directly to the U. S. Veterans' Bureau the original forms called for in reference (a), and to forward to this bureau carbon copy of these forms marked "For the Bureau of Medicine and Surgery."

E. R. STITT.

Circular letter.
Serial No. 230-1922.

WJCA: ESK 129733(121).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 5 December, 1922.

To: All naval hospitals within the continental limits of the United States.

Subject: U. S. Veterans' Bureau publication Med. 1644 (schema for the classification of patients on examination).

References: (a) Bureau of Medicine and Surgery letter WJCA: ESK 129733 (113) of 23 November, 1922.

(b) Letter from Director, U. S. Veterans' Bureau of November 20, 1922.

Enclosures: (1) Copy of schema mentioned in subject.

1. Reference (a), addressed to commanding officers of several of the naval hospitals, is hereby cancelled, and future reference to the subject of this letter should refer to this circular letter.

2. The Director of the U. S. Veterans' Bureau has requested that the accompanying schema for the classification of patients on examination be used for all beneficiaries of the Veterans' Bureau under treatment for pulmonary tuberculosis in naval hospitals.

3. This bureau has requested the U. S. Veterans' Bureau to forward to the commanding officers of the various Naval Hospitals a sufficient number of these schemata that each medical officer in hospitals caring for Veterans' Bureau patients may be furnished with one copy.

E. R. STITT.

Circular letter.
Serial No. 231-1922.

WSD/JBC 124677-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 7, 1922.

To: All naval hospitals in the United States, sick quarters, marine barracks, Quantico.

Subject: Use of Navy standard caskets for shipment or local burial.

1. The naval medical supply depot, Brooklyn, N. Y., has on hand a large surplus of Navy standard caskets purchased during the World War. It is desirable for reasons of economy, and because of the considerable storage space occupied, that these caskets shall be used by the hospitals instead of caskets purchased from contracting undertakers under annual requisitions for care of the dead.

2. It is therefore directed that naval hospitals shall, until further notice, make use only of the item under requisition for preparation for shipment which provides for furnishing of casket by the Government, the intention being that the Navy standard casket shall be used in every case.

3. It is noted that at a number of the hospitals the requisition for local burial of the dead makes no provision for the furnishing of a casket by the hospital. It is presumed that a unit bid was accepted, providing for all necessary services, including casket furnished by the undertaker, in which case, probably, it will be impossible for these hospitals to utilize Navy caskets for local burials during the life of the present contracts. At the Navy hospitals, Portsmouth, N. H., Annapolis, Md., Puget Sound, Wash., Mare Island, Calif., and San Diego, Calif., however, Navy standard caskets will be issued to the undertaker for encasement of bodies prepared for local burial.

4. Immediate requisition will be made on the naval medical supply depot, Brooklyn, N. Y., or Mare Island, Calif., for a sufficient stock of caskets to comply with the above directions, and subsequent requisitions will be made, from time to time, so that the number carried shall be always sufficient to meet the usual requirements of the hospital and render the purchase of caskets from contracting undertakers unnecessary.

5. The Navy standard casket will be used for deceased Veterans' Bureau patients and for retired enlisted men of the Marine Corps. (M. & S. circular letter, serial No. 221-1922, No. 124677-O, October 12, 1922.)

6. In special cases, where death occurs distant from the hospital, as in case of aviators or at civilian hospitals, etc., and where the terms of the contract do not apply, the expenses for the care of the dead will be covered by appropriate "special" requisitions in each such case, prepared after all expenses in the particular case have been ascertained. Navy standard caskets will be issued for these cases if practicable.

7. These instructions shall not be construed to prevent the purchase of a casket in an emergency when it is impracticable to procure a Navy standard casket.

8. For the fiscal year 1924 the bureau will furnish a form or detailed instructions for preparation of requisitions for care of the dead. The hospitals will withhold their annual requisitions for care of the dead until these instructions are received.

E. R. STITT.

Circular letter.
Serial No. 232-1922.

WEE: SS 124680(122).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 8, 1922.

To: All medical officers.

Subject: Syphilitic abstract sheet in health record.

1. Until a new supply is available for distribution, it is desired that syphilitic abstract sheets shall be made out in the case of all personnel in which a diagnosis of syphilis is made and attached to the health record.

2. At present the abstract sheet bears the notation "(Enlisted men only)". This notation hereafter will no longer apply.

E. R. STITT.

31847-43
N65-JPL-BL

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
Washington, D. C., 11 October, 1922.

BUREAU MANUAL CIRCULAR NO. 13.

From: Bureau of Navigation.

To: All ships and stations.

Subject: Medical discharges.

1. The following changes in Bureau of Navigation Manual are approved and directed to be made upon receipt of this letter:

ART. D-8030. Strike out and substitute the following:

ART. D-8030(a). In the cases of newly enlisted men who have been examined and passed at recruiting stations this examination will be considered final and they are not to be rejected upon examination after arrival at the training stations.

(b) In all cases of manifest unfitness such men will be sent to a hospital for observation prior to medical survey.

(c) Great caution is to be observed in regard to defects and diseases that can be easily simulated.

(d) No enlisted man shall be discharged from the service on account of medical survey without the approval of the Bureau of Navigation.

(e) Any defects or disabilities noted upon examination at the training station will be entered in the man's health record.

R. H. LEIGH, *Acting*.

Circular letter.

RA/LJT 129733(93).

Serial No. 233-1922.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 14, 1922.

To: All naval medical officers.

Subject: Discontinuing the use of a signed statement in the health records upon release or discharge, claiming or waiving claim for compensation under the war risk insurance act.

Reference: Paragraph D-8063, Bureau of Navigation Manual.

1. The Bureau of Medicine and Surgery was advised recently by the United States Veterans' Bureau that, in their opinion, the use of a signed statement in health records, claiming or waiving claim for compensation, was of no value in adjudicating claims for compensation or vocational rehabilitation, and in so far as the United States Veterans' Bureau was concerned its use could be discontinued.

2. The Bureau of Navigation concurred in this opinion and has stated that " * * * change in Bureau of Navigation Manual will be issued to the service canceling this requirement."

3. In view of the above the use of a signed statement in the health record, claiming or waiving claim for compensation under the war risk insurance act, will be discontinued.

E. R. STITT.

Circular letter.

NLS-EGM F-4-42022

Serial No. 234-1922.

124482(123).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 16, 1922.

To: All medical officers, chief pharmacists, and pharmacists.

Subject: Preparation and forwarding of Form N. M. S. H. C. 4, Roster Report of the Hospital Corps.

Reference: (a) Bureau of Medicine and Surgery circular letter, serial number 14-20 of 4 March, 1920.

(b) Section 7, chapter 54, U. S. Navy Regulations, 1920.

1. Paragraph 1 of reference (a) is hereby canceled.

2. The Roster Report of the Hospital Corps will be forwarded in accordance with the instructions contained in reference (b) and on the face of the report.

3. When the last Saturday in a month immediately precedes or follows the last calendar day of a month, the monthly roster only shall be submitted by stations forwarding the report weekly.

4. On the face of the monthly roster shall be reported all receipts, transfers, enlistments, reenlistments, extensions of enlistment, discharges, desertions, deaths, changes of rate, and receipts as patients of Hospital Corps men occur-

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ring during the month reported. This is in addition to similar information reported weekly.

5. On the reverse of the monthly roster the names of Hospital Corps men who are patients received from other stations or ships, and who are en route to other stations or ships, shall be reported after the names of Hospital Corps men attached to the crew; Hospital Corps men attached to the crew who are on the sick list shall be shown in their usual alphabetic position as "On sick list." The diagnosis shall be given in all cases of men reported as patients or on sick list.

E. R. STITT.

Circular letter.
Serial No. 235-1922.

WSG 128014(124).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 30, 1922.

To: All Medical Department personnel.

Subject: Manual of the Medical Department, 1922.

Reference: Article 74, Navy Regulations, 1920.

1. The accompanying Manual of the Medical Department has been carefully prepared by revising the edition of 1917 and by bringing the subject matter down to date of October, 1922.

2. It is desired that errors and omissions be immediately reported, and that changes and additions be suggested from time to time.

3. In letters to the bureau reporting errors or making suggestions, the "Subject" should be stated as above, and reference should be made to the paragraph discussed as follows:

Paragraph 1481 (b), line 3.

E. R. STITT.

Circular letter.
Serial No. 236-1922.

HWS:MFD 124920(124).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., December 30, 1922.

To: All medical officers.

Subject: Arsphenamine and neoarsphenamine.

References: (a) Circular letter 44-1920 of 10 July, 1920.

(b) Circular letter 208-1922 of 17 August, 1922.

(c) Report of a board, published in the U. S. NAVAL MEDICAL BULLETIN of November, 1922.

1. Reference (a) contains instructions to the effect that arsphenamine should be employed only at hospitals, and that neoarsphenamine exclusively be used elsewhere. Reference (b) repeated these instructions, amplifying them in certain details.

2. It has been brought to the attention of the bureau that reference (c) prescribes the use of articles of apparatus differing in some respects from those listed on the Supply Table; and further that in reference (c), which by reason of its source and the circumstance of its publication in the BULLETIN has something of the force of instructions, there appears statements concerning the choice of drugs that represent views apparently at variance with those prompting the issue of references (a) and (b).

3. Relative to items of apparatus, it is believed that articles now on the Supply Table can be made to fulfill all requirements, provided their use is governed by an understanding of the principles to be observed.

4. Relative to the choice of drugs, the bureau, recognizing the higher and more uniform therapeutic efficiency of arsphenamine and its greater stability,

concurs fully in the conclusions of the board regarding the general desirability of employing it in preference to neoarsphenamine. Nevertheless, it is believed that the liability to accidents arising from the improper administration of arsphenamine is sufficiently great to justify restricting the use to institutions where adequate apparatus and materials are at hand.

5. While the undoubted lack of stability of neoarsphenamine constitutes a real objection to its use, particularly in low latitudes, the bureau is authoritatively informed that neoarsphenamine, as now prepared and tested before issue, can be administered safely without regard to time, temperature, or other conditions influencing stability, if the specimen used passes successfully the tests enumerated in reference (c).

6. Therefore the instructions contained in references (a) and (b) are reaffirmed, and extended as follows:

7. In view of the rather numerous instances reported in medical literature when one drug was mistaken for the other, and administered with correspondingly inappropriate technic, it is directed that hereafter only one of these two drugs be carried in stock, for purposes of administration, at any one place—i. e., at hospitals, arsphenamine alone will be carried; elsewhere, neoarsphenamine. Should there appear to be good reason for using either drug otherwise than as specified in this paragraph, the matter will be made the subject of a special letter to the bureau.

8. Hospitals having on hand stocks of neoarsphenamine will return them to the nearest naval medical supply depot.

E. R. STITT.

N6-BL
57354-74

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
Washington, D. C., 22 December, 1922.

Bureau of Navigation Circular Letter No. 66-22.

To: All ships and stations.

Subject: Advancement of hospital apprentices.

1. In order to establish a flow of promotion in the nonrated grades of the Hospital Corps, commanding officers of ships and stations are authorized, until further notice, to advance hospital apprentices, second class, to hospital apprentices, first class, in excess of allowed complement and without reference to the bureau. Men so advanced must have all qualifications required by Bureau of Navigation Manual.

2. The total number of hospital apprentices, second class, advanced in accordance with this authority shall not exceed in any command the total vacancies existing in the higher ratings of Hospital Corps men; that is, the total number of Hospital Corps men on board shall not exceed the total number authorized in complement.

(s.) THOMAS WASHINGTON.

Circular letter.
Serial No. 237-1923.

NLS EGM F 3 42022.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., January 16, 1923.

To: All medical officers.

Subject: Service numbers of enlisted men.

Reference: Articles D-9000 and D-9004, Bureau of Navigation Manual.

1. It is directed that the service number assigned men newly enlisted in the Hospital Corps and who change their rating to the Hospital Corps be

reported to the Bureau of Medicine and Surgery on the Form N. M. S. H. C. 3, forwarded at time of enlistment or change of rating.

E. R. STITT.

Circular letter.
Serial No. 238-1923.

AWD MET 127039(13).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 19 January, 1923.

To: All medical officers.

Subject: Resignations.

1. In view of the frequent expression by Navy medical officers of discontent, voicing the feeling that the Naval Medical Service offers but a poor return for accepting a commission therein, the following extracts from letters and applications recently received in the Bureau of Medicine and Surgery from ex-medical officers of superior qualifications, who have recently resigned, are published for the purpose of bringing to the attention of those contemplating resignation or advising others to resign the reverse side of the picture. It is realized that present conditions, relative to the rank of the medical officer age for age as compared with other branches of the service, is not satisfactory; but it is evident from letters received that in spite of this and other matters of discontent the service has attractions not balanced by civil practice. Aside from rank and emoluments, it is a pleasure to note two of these officers show that there exists a love of "the service" which evidently was not self-evident until out of the Navy.

"According to our telephone conversation, during which I asked you to be reinstated in the service and my resignation recalled, I am mailing you, as requested, my address.

"I want you to know that I realize what a great mistake I made, and if reinstated it will not happen again."

"I resigned from the Medical Corps of the Navy, effective * * * and desire very much to be reinstated. I am convinced that the Navy offers infinitely greater opportunity than civilian practice, especially in such details as apparatus for detailed study of cases in hospital.

"I feel that, knowing the advantage of the service, especially as compared with civilian practice, that I would be an efficient officer, and I am quite confident that I would dispel any discontent with the service among other junior officers with whom I might be stationed. I do not believe that there is a medical institution in the world where the apparatus and other means for expert diagnosis and treatment are as available as in the United States Navy."

"After having been detached from duty * * *, and my resignation from the service having been accepted * * *, I find after some time of consideration that I prefer the Navy to the civilian life. I feel that I have become more adapted for work in the service and have more interest for work in it as well.

"I should very much like to reenter the service and have my resignation revoked or recalled and be reinstated with my former rank—lieutenant."

"After due consideration I find that I prefer to reenter the Medical Corps of the United States Navy.

"I regret very much of ever having resigned, since I was entirely pleased with the service, and my interest for that branch of the service has become even more intense since my relations have been severed.

"If it is necessary to reenter as an assistant surgeon, I will be pleased to have an application blank forwarded me as soon as possible."

"Ever since I resigned from the Medical Corps last * * *, I have felt discontented and homesick for my old Navy friends and associations. Although

I have been in private practice but a little over * * *, I have been successful, especially in a financial way. I am also fortunate enough to own a home in a section composed mostly of doctors. Even so, I have not been particularly happy or contented. Do you think that my services would be of sufficient value to the Navy to warrant reinstatement in my former number on the list? I would appreciate very much your opinion or advice on this question."

"I am seriously considering making application for reinstatement as Lieutenant, Medical Corps, United States Navy, but before doing so I would like some information on the following questions:

"1. Is my reinstatement possible?

"2. Would my previous service count on length of service after reinstatement?

"3. Would I be reinstated as Lieutenant, and how many numbers would I lose if reinstated at once? I have been away from the service about * * *.

"4. Would an examination other than physical be necessary?

"I had promises of an excellent chance to make good money in civilian life at the time of my resignation, but have found that they are and were but promises."

"I am taking the privilege of writing you in the hopes that something may be accomplished to aid me in a situation which to me is all important.

"* * * I resigned my commission as Lieutenant, Medical Corps, United States Navy, in order to go into private practice after * * * years' service. At that time I had the idea that I would be happier in private practice and would never regret my Navy associates and naval medical work. I have given it * * * months' trial, and although I have been unusually successful in getting started and in a financial way, I am most anxious to return to the Navy, even to such an extent that it has affected my very existence and contentment of mind. I really regret to admit the facts after taking the decisive step in resigning, but I am positive that I never realized that I would be so discontented.

"I know that it will be a difficult matter for me to receive back my old number on the list in the Medical Corps, but I am living in the hopes that it can be accomplished, although it required congressional legislation. I have heard that the Navy is seeking new medical officers, and I should think that my * * * of experience would be an asset in my favor."

"I have been trying ever since my return to * * * to find time to drop in to see you and pay my respects. I regret very much that it has been impossible for me to do so. I scarcely ever get away from the hospital until after your office is closed.

"I want you to know that I realize that I have made a mistake and I am very sorry that I did not take your advice and wait until next summer, at least, to resign. Had I done that I know that I would have continued in the service. Experience, however, is after all the best teacher, and I have certainly learned my lesson well. I see matters now in an entirely different light and the mere fact that I am writing you in this way is proof of the fact that I am deeply repentant of the whole episode. I hope that you will forgive me for disappointing you.

"I love the Navy and find myself longing for it, and I doubt very much whether I will ever be satisfied any place else. I trust that you will not think me presumptuous when I ask you whether or not there is a chance of my reinstatement, and if it could be arranged, whether or not you would look with favor upon it."

E. R. STITT.

Circular letter.
Serial No. 239-1923.

WJCA:FSK 129733(14).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 26 January, 1923.

To: All naval hospitals caring for beneficiaries of the United States Veterans' Bureau.

Subject: Report of Hospital Inspection, Form 2566, United States Veterans' Bureau.

Inclosures: (1) Report of Inspection, United States Veterans' Bureau Form 2566.

1. In accordance with a request from the Director of the United States Veterans' Bureau, the accompanying inclosure is forwarded to each naval hospital caring for Veterans' Bureau patients.

E. R. STITT.

Circular letter.
Serial No. 240-1923.

WEE:SS 124957(23).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 5, 1923.

From: The Chief of the Bureau of Medicine and Surgery.

To: Medical officers at Navy and Marine Corps recruiting stations.

Subject: Physical examinations, inoculations and vaccinations of applicants to attend citizens' military training camps, 1923.

1. It is desired that medical officers of the Navy stationed at training stations shall cooperate in every respect in conducting physical examinations and immunizations to smallpox and typhoid and paratyphoid fevers of applicants for training in a citizens' military training camp during the summer, 1923. It is, therefore, directed that when an applicant presents himself the medical officer shall complete the physical examination as set forth in the application blank, which will be presented by the candidate.

2. Upon completion of the physical examination, the papers will be returned to the applicant who will forward them to the corps area commander. If upon receipt of the papers at corps area headquarters it is found that the applicant has not been immunized to typhoid and paratyphoid fevers during the previous three-year period but is otherwise qualified for training, the necessary typhoid-paratyphoid vaccine will be forwarded to the medical officer who conducted the physical examination, and the applicant will be notified to report to him for vaccination. If it is found that the applicant requires vaccination against smallpox, he will be notified that he must be so vaccinated by a physician or he may, if he so desires, procure the vaccine by purchase or otherwise and report to the medical officer who conducted the physical examination for vaccination. When the vaccinations are completed certificates will be signed and returned to the applicant, who will dispose of them in the manner directed. The larger proportion of the examinations and vaccinations will be made during the months of March to June, inclusive.

3. The military organization within the territorial limits of the United States consists of nine corps areas. The activities in connection with the citizens' military training camps located in any corps area are under the direct control of the commanding general of that corps area. Acting under instructions from

the War Department, each corps area commander will communicate with the officers of the Navy at the designated stations and will furnish them information relative to the location of camps and other data as may be pertinent.

E. R. STITT.

Circular letter.

WSG 132589(22).

Serial No. 241-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 8, 1923.

To: All naval hospitals, naval medical supply depots, naval medical school, U. S. S. *Mercy*, and U. S. S. *Relief*.

Subject: An act making appropriations for the Navy Department and the naval service for the fiscal year ending June 30, 1924, and for other purposes (approved January 22, 1923).

References: (a) Alnav 28, 4320-1230, June 30, 1922.

(b) S. & A. letter #147-44-E, December 30, 1922.

(c) This bureau's letter #132586(63), 9th ultimo.

Inclosure: (a) Copy of above-mentioned act (H. R. 13374) (Public—No. 384—67th Congress).

1. The bureau incloses herewith two copies of the act above mentioned and directs that they be made available to all members of the staff, including Hospital Corps men engaged on office work.

2. An accurate knowledge of appropriational matters is essential to the proper allocation of charges; that such knowledge is not widespread throughout the Medical Department is evidenced by the large number of invoices received in the Bureau of Supplies and Accounts, and referred here for correction, on which the wrong appropriations of this bureau are debited.

3. The appropriations pertaining strictly to this bureau will be found on pages 15, 16, and 17 of the inclosed act.

4. The appropriation "Care of hospital patients" will continue under the immediate and direct control of the bureau, and under no circumstances will any charges be placed against it except by specific authority from the bureau.

5. Restrictive legislation relating to passenger-carrying vehicles will be found on page 17 of the act, under "Maintenance, yards, and docks."

6. The value of commuted rations stopped on account of sick in hospitals is fixed for the fiscal year 1924 at 75 cents (p. 14); this rate for three meals will govern the charges made against the pay of civilian employees for subsistence; it will also be the rate of charge in the duty-officers' mess; the charge for less than three meals in all cases will be 25 cents per meal.

7. The pay and allowances of members of the Nurse Corps, with new language "including assistant superintendents, directors, and assistant directors," will be found on page 13 of the act.

8. On page 14 of the act provision is made for "subsistence in kind at hospitals and on board ship in lieu of subsistence allowance of female nurses"; the Assistant Secretary of the Navy in Alnav 28 (reference a) directed that at hospitals and aboard ship nurses should be subsisted "in kind as heretofore"; the Bureau of Supplies and Accounts (reference b) has defined the words "Subsisted in kind" as applied to nurses in this connection, as follows:

"(a) Nurses attached to ships are subsisted in kind when they are subsisted at the expense of the Government by being furnished meals, either directly by the commissary officer or in an officers' mess. * * *."

"(b) Nurses subsisted in kind at hospitals are subsisted by the commissary officer as a direct charge to the * * * naval-hospital fund, which * * * is subsequently credited, and provisions, Navy, charged upon vouchers prepared by the Bureau of Medicine and Surgery * * *."

This Supplies and Accounts letter, just quoted in part (reference b), was forwarded to all hospitals and the *Relief* and *Mercy* by the bureau's letter (reference c) of the 9th ultimo.

E. R. STITT.

Circular letter.
Serial No. 242-1923.

126472(21).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 9, 1923.

To: All naval hospitals.

Subject: Admission of dependents of officers and enlisted men as supernumeraries at naval hospitals.

Reference: Bureau's letter No. 132687-0(102), October 12, 1922.

1. It appears that in some instances the above-mentioned letter has been erroneously interpreted as modifying instructions relative to the admission of supernumeraries.

2. Those legally entitled to treatment and subsistence in naval hospitals are:

(a) The personnel of the "regular" Navy and Marine Corps, active and retired, and certain classes of the fleet reserve.

(b) Pensioners who relinquish their pensions while in hospital.

(c) Enlisted men whose enlistments expire after admission to hospital.

(d) Civil employees injured in Government establishments, admitted by direction of Compensation Commission.

(e) Veterans' Bureau patients.

3. The bureau would be favorably inclined to provide for the care and treatment of dependents to the extent of its available personnel and equipment at the various hospitals, but in the absence of legal authority and of a specific appropriation available for this purpose, the admission of these dependents is not authorized except when necessary for humanitarian, emergency, or public health reasons.

E. R. STITT.

Circular letter.
Serial No. 243-1923.

WEE: SS PR&R 124957(23).
DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 19, 1923.

From: The Chief of the Bureau of Medicine and Surgery.

To: Medical officers at Navy and Marine Corps recruiting stations.

Subject: Physical examinations, inoculations, and vaccinations of applicants to attend citizens' military training camps, 1923.

Reference: Circular letter, serial No. 240-1923, dated February 5, 1923.

1. Attention is invited to paragraph (1) of the bureau's circular letter, No. 240-1923, in that it states that medical officers stationed at training stations shall cooperate in every respect in conducting physical examinations and immunizations to smallpox and typhoid and paratyphoid fevers of applicants for training in a citizens' military training camp during the summer, 1923.

2. In order that there may be no misunderstanding, it is desired that medical officers attached to recruiting stations perform the same duties as outlined in the circular letter, which was intended to apply to the medical officers at recruiting stations as well as training stations.

E. R. STITT.

Circular letter.
Serial No. 244-1923.

WSG:ESK 125949(92).
113366.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 21, 1923.

To: All naval hospitals.

Subject: Checkage of officers for subsistence while under treatment in hospital but not subsisted or quartered at hospital.

References: (a) Sections 1614, 4807, 4808, and 4812, Revised Statutes.

(b) Department's 11th indorsement, 7869, August 12, 1907.

(c) Bureau's 4th indorsement, 113366/125949(92), November 16, 1922.

(d) Department's letter, 9047-1271-K, December 14, 1922.

1. In 1907 the department (ref. b) held that where an officer "attended the hospital merely for * * * treatment and when on each such day treatment was concluded he proceeded to his home," and "as in the present instance Colonel Denny's admission into the hospital was but nominal, and as he was not maintained at its expense, * * * the deductions in question should not be made."

2. In reference (c) the bureau made request that the department should reconsider its above partly quoted opinion, and that for purposes of its further use in the Paymaster's Manual, United States Marine Corps, said opinion should be revoked.

3. In his letter to the bureau (ref. d) the Secretary has reaffirmed the opinion of August 12, 1907 (ref. b), as follows:

"1. Returned.

"2. Section 4812, Revised Statutes, provides:

"'For every Navy officer, seaman, or marine admitted into a Navy hospital the institution shall be allowed one ration per day during his continuance therein, to be deducted from the account of the United States with such officer, seaman, or marine.'

"3. This law required that the value of one ration be deducted from the pay of an officer for each day he remains in a naval hospital.

"4. Under the circumstances set forth in the attached letter where an officer is treated at a naval hospital, but is not quartered or subsisted at the hospital, although the hospital records show him to be in receipt of treatment, the officer has not 'been admitted in a naval hospital' within the meaning of section 4812, Revised Statutes, above quoted, and therefore there is no authority to deduct from his account with the United States the value of one ration per day.

"5. The practice of admitting an officer to a naval hospital and issuing a notice of checkage of rations on such admittance, when it is known at the time of admittance that he is not to be subsisted at the hospital, should not be followed. The same practice should obtain in such cases as where the officer reports at a naval dispensary for treatment.

"EDWIN DENBY."

4. In accordance with the foregoing quoted decision, no checkage of rations will be made, except as hereinafter stated, in the case of any officer of the Navy or Marine Corps admitted to a naval hospital when it shall be positively known and unequivocally understood at the time of his admission that he will not be subsisted or quartered at the hospital.

5. The ration notice of admission (Form S) in such a case will be made to read "was admitted to this hospital on January 1, 1923 (?), and will *not* be subsisted by the hospital." Should such a case, after admission, require quarters and subsistence, the changed subsistence status will be taken care of when the ration notice of discharge shall be issued, which will be made to read "was admitted to this hospital on January 1, 1923, and subsisted by the hospital from January 20, 1923, to February 28, 1923, inclusive."

6. The decision of the department above quoted does not contemplate that officers in such cases shall have quarters reserved for them which they may occupy at their volition, and during such period of occupancy receive subsistence, as this clearly would not be the same practice as would obtain "at a naval dispensary."

7. The ration notices (Form S and T) will be revised, but pending receipt of the new prints the naval hospital will issue them, when necessary, as indicated above.

E. R. STITT.

Circular letter.
Serial No. 245-1923.

WSG:ESK 126093(91).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., 21 February, 1923.

To: All naval hospitals.

Subject: Administration of oaths.

References: (a) This bureau's letter to "all naval hospitals" 126093(91) of Dec. 28.

(b) Bureau's third indorsement 126093(91) of Jan. 3.

(c) Judge Advocate General's 4th indorsement 19037-150:1 of Jan. 24.

1. Bureau's third indorsement to the Judge Advocate General (ref. b) was as follows:

"1. Information is requested of the Judge Advocate General as to whether this authority to administer oaths for a particularly stated naval purpose will also permit commanding officers to administer oaths in other than naval cases where the printed form relating to such oaths gives instruction that the oath may be administered by 'notary public, clerk of court, or any person authorized to administer oaths'; the affidavit on the Federal income-tax return, for instance, provides that the oath may be administered 'by any * * * naval officer who is authorized to administer oaths for purposes of * * * naval administration.'

"2. It would be convenient in the private and personal business affairs of officer and enlisted patients, and perhaps vitally important in cases of impending death, that the commanding officer should have this authority."

2. In reply the following indorsement (ref. c) was received under date of January 24:

"1. Forwarded, all papers returned.

"2. In the first paragraph of the third indorsement information is requested as to whether the authority to administer oaths granted by the Secretary of

the Navy to the commanding officers of naval hospitals for a specific purpose also authorizes them to administer oaths in other than naval cases where the printed form relating to such oath gives instruction that the oath may be administered by 'notary public, clerk of court, or any person authorized to administer oaths'; the affidavit of a Federal income-tax return, for example, provides that the oath may be administered 'by any naval officer who is authorized to administer oaths for purposes of naval administration.'"

3. In the second paragraph of said indorsement it is further stated that it would be convenient in the private and personal business affairs of the personnel connected with naval hospitals, "and perhaps vitally important in cases of impending death that the commanding officer should have this authority."

4. The act of January 25, 1895 (28 Stat. 639), as amended and reenacted by the act of March 4, 1917 (39 Stat. 1171), provides, relative to the administration of oaths by officers of the naval service, as follows:

"That judges advocate of naval general courts-martial and courts of inquiry, and all commanders in chief of naval squadrons, commandants of navy yards and stations, officers commanding vessels of the Navy, and recruiting officers of the Navy, and the adjutant and inspector, assistants adjutant and inspector, commanding officers, recruiting officers of the Marine Corps, and such other officers of the regular Navy and Marine Corps, of the Naval Reserve Force, of the Marine Corps Reserve, and of the National Naval Volunteers as may be hereafter designated by the Secretary of the Navy be, and they are hereby, authorized to administer oaths for the purpose of the administration of naval justice and for other purposes of naval administration."

5. Consideration of the authority requested and granted by the Secretary of the Navy to commanding officers of naval hospitals discloses that the authority to administer oaths was specifically limited to the reenlistment or the extension of the enlistments of personnel of the Hospital Corps and patients under their respective commands. In the opinion of this office the foregoing does not authorize the administering oaths by the commanding officers of naval hospitals in other than naval cases where the printed forms relating to such oaths gives instruction that the oath may be administered by "any person authorized to administer oaths." It is the further opinion of this office that the foregoing does not authorize such officers to administer oaths for the purpose of making Federal income tax returns.

6. The foregoing opinion is based upon the fact that the authority to administer oaths granted to the commanding officers of naval hospitals is limited to one purpose and that the provision of the act of March 4, 1917 (39 Stat. 1171), above quoted, applies only to those cases where naval officers are authorized to administer oaths "for the purpose of the administration of naval justice and for other purposes of naval administration."

J. L. LATIMER.

Approved 24 January, 1923.

EDWIN DENBY,

Secretary of the Navy.

3. The opinion of the Judge Advocate General, approved by the Secretary of the Navy, becomes a decision of the department and is binding.

E. R. STITT.

Circular letter.
Serial No. 246-1923.

WRJ: ML 125884(24).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 23, 1923.

To: All naval hospitals.
Subject: Allotments for fiscal year 1924.

1. In order that the bureau may comply with existing instructions relative to the apportionment of appropriations by quarters, it is directed that requests for allotments state, where equal quarterly allotments are not indicated, the amount that will be required for each quarter. For example, the request covering coal will show a larger amount for the second and third quarters than for the first and second quarters.

2. In this connection it may be stated that all allotments for the fiscal year will be divided into quarterly amounts and that semiannual and annual allotments will not be granted, except for the appropriation, "Bringing home remains, etc."

3. Activities that have submitted requests for allotments for the fiscal year 1924, where equal distribution by quarters is not indicated, will immediately forward corrected requests showing the distribution desired.

E. R. STITT.

Circular letter.
Serial No. 247-1923.

WEE: SS 126472(24).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., February 28, 1923.

To: Commanding officers, all naval hospitals and hospital ships.
Subject: Supernumerary patients—Admission and discharge, or other data concerning.

Inclosure: Sample of form to be used.

1. In order that data relative to personnel may be properly filed, it is necessary that the full name, together with the place and date of birth and rating or rank of the individual be furnished the bureau. The admission and discharge of supernumeraries is now being reported to the bureau without complete data. It is, therefore, necessary that hereafter these reports will be made in a form similar to the attached.

2. The supply depot has been instructed to maintain a supply of printed forms for distribution and until the printed form is available report will be made by letter, following the form as attached.

E. R. STITT.

U. S. NAVAL HOSPITAL.

From: Commanding officer, United States naval hospital.
To: Bureau of Medicine and Surgery.
Subject: Supernumerary patient.
Reference: Authority.

1. The following-named supernumerary patient was {admitted to
discharged from} the
naval hospital this date.

Name in full.
(Surname capitalized.)

(Diagnosis.)

Date of birth.

Place of birth.

Circular letter.
Serial No. 248-1923.

WSD/JBC 124677-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., March 3, 1923.

To: All naval hospitals in the United States; sick quarters, Marine Barracks, Quantico, Va.; Naval Submarine Base, San Pedro, Calif.

Subject: Annual requisitions for care of the dead, fiscal year 1924.

References: (a) M. & S. circular letter serial No. 231-1922, #124677-O, December 7, 1922.

(b) Manual for the Medical Department, paragraphs 2951, 2953, 2972.

1. Referring to paragraph 8 of the above-mentioned circular letter, it is directed that requisitions for care of the dead shall be prepared substantially in the following form, with such amendments only as may be necessary to meet peculiar local conditions.

Local burial (contingent).

Item 1: For preparation for burial of the remains of the dead (Navy, Marine Corps, Naval Reserve Force on active duty, and supernumerary patients) during the fiscal year 1924, including embalming, all necessary preparation, and placing in casket (necessary clothing, casket, and outside box to be furnished by Government).

Item 2: For transportation of remains to local cemetery, including hearse and one carriage or seven-passenger automobile, health department permit, etc.

Item 3: For all service, etc., included in item No. 1, except that casket and outside box, will be furnished by undertaker.

Item 4: For opening and closing of grave, including necessary attendants at cemetery.

Item 5: For care of the remains of the dead (Navy, Marine Corps, and Naval Reserve Force on active duty) shipped to the naval hospital incased for burial; service to consist of transfer of remains from transportation company's terminal or other place of arrival, care of remains pending burial, health department permits, etc.

Item 6: For additional service under item No. 5, consisting of reembalming and rearrangement in casket, or transfer to another casket furnished by Government.

Shipment (bringing home remains).

Item 1: For the preparation of the remains of the dead (Navy, Marine Corps, and Naval Reserve Force on active duty) during the fiscal year 1924, including embalming, all necessary preparation, and placing casket (necessary clothing, Navy standard shipping casket and outside box to be furnished by Government).

Item 2: For delivery of remains to shipping point; health department permit, etc.

Item 3: For all services, etc., included in item No. 1, except that incasement (including inside shell, metallic casket, and shipping box, all complete) will be furnished by undertaker.

Item 4: For additional service under above items, consisting of hearse and one carriage or 7-passenger automobile to shipping point.

Item 5: For care of the remains of the dead (Navy, Marine Corps, and Naval Reserve Force on active duty), shipped to the naval hospital incased for burial; service to consist of transfer of remains from place of arrival to hospital or to

contractor's establishment; care of remains pending reshipment; delivery to shipping point; health department permits, etc.

Item 6: For additional service under item No. 5, consisting of reembalming and rearrangement in casket, or transfer to another casket furnished by Government.

Notes to be placed on both requisitions.

NOTE 1.—Services to be rendered promptly upon receipt of notification, and all services rendered and material supplied to be of a kind and character satisfactory to the commanding officer.

NOTE 2.—It is requested that proposals be submitted to the commanding officer before award shall be made in order that investigation may be made of the quality of material and character of services bidders propose to furnish. Bidders will be required to exhibit the finished casket, hearse, etc., they propose to furnish; otherwise bids will not be considered.

NOTE 3.—It will be necessary to make awards under Requisitions ——— and ——— to the same person, as when services are first required in any case it may not be known whether the remains are to be shipped or locally interred.

2. Referring further to the bureau's circular letter No. 231 (ref. a), it is intended that item 3 of the requisitions shall be used only in emergency. A sufficient stock of Navy standard caskets will be kept on hand at all times to supply anticipating needs both for purposes of shipment and local burial.

3. Referring to circular letter, serial No. 221-1922, No. 124677-O, October 12, 1922, requisitions for care of remains of retired enlisted men of the Marine Corps will not be renewed. As such cases will be very infrequent, each case will be handled separately. The body will be turned over to the contract undertaker, and his bills for services, duly certified by the hospital, will be forwarded directly to the quartermaster, headquarters, United States Marine Corps, Washington, D. C., for payment. If the body is shipped by express, notation will be made on the bill of lading that charges are to be billed against the quartermaster, headquarters United States Marine Corps; if on two first-class tickets, the appropriation entered will be "Maintenance, quartermaster's department, Marine Corps."

4. The requisitions for care of the dead, both under "Contingent, M. & S.," and "Bringing home remains, etc.," will show an estimated cost for one payment only.

5. Requests for allotments for transportation and clothing will be submitted but will show no estimated cost.

6. Requisitions and allotments for this character of expenditures are not subject to administrative control, and to allot amounts to each activity only tends unnecessarily to tie up the appropriations. The bureau will set up a reserve for the care of the dead, and when "reports of expenditures" are received the reserve will be debited with the amount actually expended.

F. L. PLEADWELL, *Acting.*

Circular letter.
Serial No. 249-1923.

HWS:MFD 132679(31).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., March 5, 1923.

To: All medical officers.

Subject: Administration of carbon tetrachloride.

In view of the rapidly extending employment of carbon tetrachloride in the treatment of hookworm infestation, it seems well to place before the service the latest information available concerning its administration.

1. The specimen of tetrachloride used should be one known to be chemically pure. It should be stored in tightly stoppered containers, protected from sunlight and, as far as possible, from heat.

2. For the present it is to be emphasized that the dose should not exceed 3 cubic centimeters for an adult of 150 pounds. In larger dosage the drug is apparently not more effective and may prove harmful.

3. It is to be administered in hard gelatine capsules. Soft gelatine capsules are unsuitable in that they often become insoluble in the intestinal tract and escape intact with the feces. Suspensions are dangerous. Tetrachloride, being practicably insoluble in water, collects at the bottom of the container and is swallowed pure at the end of the draught, thus possibly giving rise to serious symptoms by its inhalation. Milk, owing to the solubility of the tetrachloride in butter fat, is a better medium, but nevertheless is not a suitable vehicle.

4. Under certain conditions there occurs retention of the drug in the stomach, in which case digestive and nervous symptoms ensue. Some authors report that symptoms arising from this cause can be prevented by the routine use of magnesium sulphate two hours after the administration of the tetrachloride. It may prove of advantage to administer the two drugs simultaneously, but no information on this point will be available until studies now under way have been completed.

5. It has been found that when treating swine a preliminary fast is useful; but it has not been clearly shown in human cases that fasting either enhances the anthelmintic action of the tetrachloride, promotes its progress through the intestinal tract, or lessens the possibility of absorption. In fact, deprivation of food may possibly contribute to susceptibility, it having been found that glucose in a measure protects against the symptoms of tetrachloride poisoning. In any case it is well, however, to avoid the ingestion of neutral fats and other substances which act to delay evacuation of the stomach.

6. In alcoholism and certain intestinal infections absorbability appears to be greatly increased, possibly by increasing the solubility of the drug or by making the mucosa more permeable. Existing lesions heighten the susceptibility of the liver and kidney, so that if unusual amounts of the drug are absorbed the outcome depends largely on the condition of these two organs. While tetrachloride has been used without apparent injury in the presence of active fever, as in the course of kala azar and various pyrexias, it is well to avoid its use during any acute illness, and when hepatic or renal disease exists, unless the removal of hookworms is urgently indicated.

7. To summarize the principal conditions causing or leading to the development of untoward symptoms:

(a) The use of an impure specimen of the drug.

(b) Conditions in the intestinal tract, or character of its contents, such that prolonged retention of the drug is favored, its solubility increased, or its absorption promoted.

(c) Specific conditions, such as alcoholism, enteritis, and diseases of liver or kidneys.

8. Knowledge of the pharmacology of tetrachloride is still imperfect, and from reports of fatalities following its ingestion it has not been clearly established whether tetrachloride, some decomposition product, or some adulterant has been responsible, or whether conditions peculiar to the patient or casually present may have determined the outcome. In the cases reported, necrosis and fatty degeneration of the liver have been the most conspicuous features of the pathology, whereas in animals succumbing to lethal doses this has not been observed. In them the symptoms are mainly œdema of the gastrointestinal

tract and mesentery, enlargement of the liver with capillary hemorrhages throughout its substance, hæmaturia, and hæmoglobinuria. In human cases the pathology and the symptom-complex resemble closely those seen in delayed chloroform poisoning.

9. In the light of present knowledge it is probably good practice to administer magnesium sulphate immediately on the appearance of any symptoms, however mild. If there appear symptoms which may be of import, such as tenderness and enlargement of the liver, signs of renal damage, vomiting, cyanosis, oedema, prostration, delirium, stupor, coma, sweetish (acetone) breath, and the signs of a marked disturbance of the acid-base equilibrium, immediate treatment should be instituted as for delayed chloroform poisoning.

F. L. PLEADWELL, Acting.

Circular letter.
Serial No. 250-1923.

AWD MET 125470(32).

12 MARCH, 1923.

To: All naval hospitals.

Subject: Subsistence at naval hospitals, comparison of.

Inclosures: Four.

1. The bureau forwards herewith photostats of charts showing the average cost and caloric values of dietaries of the naval hospitals within the continental limits for the fiscal year ending June 30, 1922, and certain other information.

2. It is desired especially to call attention to the high caloric value of the ration of practically all the naval hospitals, which, even allowing for the fact that a high percentage of those subsisted are vigorous young men not suffering from acute disabilities, is in excess of the recognized requirements for men actively physically engaged. This appears to indicate waste or loss of provisions. Allowing for the wastage inevitable in feeding bed patients, it is believed that a ration with a gross value of 3,500 to 4,000 calories is ample, and this estimate is sustained by such statistics as are available from civil institutions. Becker and Hamalainen, of the University of Helsingfors, Finland, as quoted in "How to Live," as a result of actual experience show that active workers, working eight hours daily, require from 2,900 to 3,600 calories only.

3. Chart No. 1 is of comparatively slight value, as the daily ration is to some extent affected by varying contract prices of food, by the character of the service, and by the fact that in some instances the ration is limited by the inability to secure other than articles carried by the supply officer. This chart should be considered in connection with chart No. 3, which shows that for the hospitals at Portsmouth, Chelsea, Newport, New York, League Island, Washington, and Norfolk there is but slight variation in the average cost of provisions. Key West and Pensacola show a considerable rise in the cost of food; Puget Sound, a slight increase; whereas Great Lakes, Mare Island, San Diego, and Parris Island show a considerable drop. These fluctuations in the cost of contract prices are in a measure reflected by the daily cost of the ration except that Annapolis and Washington show an increase of the per diem cost, hardly accounted for by higher contract prices but, to some extent, due to unique location conditions.

4. Chart No. 2: It will be noted that but four hospitals—Chelsea, League Island, Key West, and San Diego—have a ration of 5,000 calories or less. In making any comparison it is desirable to consider the well-established fact that proportionate waste lessens as the number of persons subsisted increases. For this reason the naval hospitals should be divided into two classes—those having a daily average of over 300 persons subsisted and those below that number. Under the former come the naval hospitals at New York, Mare Island,

San Diego, Washington, Norfolk, Chelsea, Great Lakes, and League Island; under the latter the naval hospitals at Annapolis, Puget Sound, Newport, Charleston, Key West, Parris Island, Portsmouth, and Pensacola. The average cost of the ration of the smaller hospitals is 83 cents, the average caloric value is 5,937, and the average cost per year of the commissary force for each man subsisted is \$60. In the group of larger hospitals the average per diem cost per patient is 74 cents, the caloric value 5,462, and the average cost of the civilian help drops to \$49. Of the larger hospitals, San Diego makes the best showing with a ration cost of 56 cents per diem, which, however, may be in a measure due to the lower cost of provisions at that port. The caloric value of the ration more nearly approximates what is considered as an adequate ration in a naval hospital—4,000 calories; also, the cost of the civilian help, on the basis given, of \$31, is the lowest of any of the larger hospitals, and only equaled by a similar charge at Newport amongst the smaller hospitals.

5. Charts Nos. 5 to 15 are submitted in order that those interested may make an analysis of the ration of each hospital during the past year and afford a basis for economy in the expenditure of certain articles of diet which are apparently, in some hospitals, consumed in excess of requirements.

6. Assuming that the cost per 100 calories holds or is decreased during the current year, it is evident that a ration of 4,000 calories, issued as a properly balanced ration, should not exceed a cost per diem of 60 cents for this fiscal year.

E. R. STITT.

Circular letter.
Serial No. 251-1923.

WSG: 126750-0(23).
125282-0(24).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., March 20, 1923.

To: All naval hospitals.

Subject: Medical periodicals and books.

Reference: Letter from Secretary, #5438-2160, February 20, 1923, in reply to bureau's communication #126750, June 21, 1922.

1. By direction of the Secretary of the Navy (ref.), all Medical Department periodicals, etc., for the bureau, including hospitals, yards, stations, and ships, for the fiscal year 1924 and thereafter, will be subscribed for to be delivered to and distributed from the bureau.

2. In accordance with the foregoing, hospitals, yards, stations, and ships will not submit requisitions for medical periodicals, etc., for the fiscal year 1924 and thereafter; standard and uniform lists of periodicals have been adopted for each hospital, yard, station, and ship, according to the various needs, copy of which will be furnished at a later date; requisitions already rendered will be destroyed upon reaching the bureau; distribution will be made from the bureau each week on and after July 1, 1923.

3. That naval hospitals may have better and more uniform reference libraries the following list of books is offered for consideration, from which each hospital may make selection. Please note that the list is arranged in two parts, as "A. For all hospitals" and "B. For additional books for the larger hospitals at Chelsea, Newport, New York, League Island, Washington, Annapolis, Norfolk, Great Lakes, San Diego, and Mare Island."

58448-23—13

A. FOR ALL HOSPITALS.

REFERENCE LIBRARY FOR MEDICAL OFFICERS.

Anatomy:	
Applied Anatomy, by Davis (Lippincott)-----	\$8. 50
Aviation:	
The Air Service Manual, by U. S. Army Air Service-----	Free.
Chemical warfare:	
Chemical Warfare, by Fries and West (McGraw-Hill)-----	2. 50
Dietetics:	
Newer Knowledge of Nutrition, by McCollum, 2d edition (Macmillan)-----	3. 80
Eye, ear, nose, and throat:	
Diseases of the Ear, by Kerrison, 2d edition (Lippincott)-----	6. 50
Field service:	
Outline of Medical Service in the Theater of Operations, by Shockley (Blakiston)-----	2. 50
Laboratory:	
Bacteriology, by Hiss, Zinsser, and Russell, 5th edition (Blakiston)-----	7. 50
Materia medica and therapeutics:	
Materia medica, by Bastedo (Saunders)-----	6. 00
Principles of Therapeutics, by Osborne (Saunders)-----	7. 00
Medicine:	
Chemical Analysis of the Blood, by Myers (Mosby)-----	3. 00
History of Medicine, by Garrison, 3d edition (Saunders)-----	9. 00
Montaigne and Medicine, by Taylor (Hoeber)-----	3. 75
Medicine, tropical:	
Tropical Diseases, by Manson-Bahr, 7th edition (Wood)-----	10. 00
Obstetrics and gynecology:	
Gynecology, by Anspach, latest edition (Lippincott)-----	9. 00
Obstetrics, by DeLee (Saunders)-----	12. 00
Pediatrics:	
Pediatrics, by Kerley (Saunders)-----	9. 00
Physiology:	
Physiology, by Howell, 8th edition (Saunders)-----	6. 50
Physiotherapy:	
Principles of electrotherapy, etc., by Turrell (Frowde, Hodder & Stoughton)-----	(?)
Rational Hydrotherapy, by Kellogg (Modern Medicine Publishing Co.)-----	6. 00
Redeeming the Maimed, by McKenzie R. Tait (Hoeber)-----	(?)
Surgery:	
Treatment of Fractures, by Scudder, 9th edition (Saunders)-----	7. 00
Anaesthesia, by Gwathney-----	6. 50
Urology:	
Syphilis, by Hazen (Mosby)-----	7. 50
X ray and radium:	
U. S. Army X-ray Manual-----	Free.

REFERENCE LIBRARY FOR NURSES AND HOSPITAL CORPS MEN.

Anatomy and physiology:	
Anatomy and Physiology for Nurses, by Lewis (Saunders)-----	\$2. 25
Pharmacy:	
Why's in Pharmacy, by Ruddiman (Wiley & Sons)-----	1. 00
Pharmaceutical Incompatibilities, by Ruddiman (Wiley & Sons)---	2. 00

Materia medica:

Useful Drugs, by American Medical Association----- Free.

Minor surgery and first aid; bandaging:

Treatment of Emergencies, by Owen (Saunders)----- \$2. 25

Minor and Operative Surgery, by Wharton (Lippincott)----- 3. 00

Nursing:

Practical Nursing, by Maxwell and Pope (Putnam & Sons)----- 2. 00

Nursing in the Acute Infectious Fevers, by Paul (Saunders)----- 1. 75

Dietetics for Nurses, by Friedenwald and Ruhrah (Saunders)----- 2. 25

Miscellaneous:

Food Inspector's Encyclopedia, by Walker (Hoeber)----- 3. 00

B. IN ADDITION TO THE PRECEDING, THERE MAY BE ADDED THE FOLLOWING FOR
THE LARGER HOSPITALS AT CHELSEA, NEWPORT, NEW YORK, LEAGUE ISLAND,
WASHINGTON, ANNAPOLIS, NORFOLK, GREAT LAKES, SAN DIEGO, AND MARE
ISLAND:

REFERENCE LIBRARY FOR MEDICAL OFFICERS.

Eye, ear, nose, and throat:

Bronchoscopy and Esophagoscopy, by Jackson (Saunders)----- (?)

Medicine:

Neoplastic Diseases, by Ewing, 2d edition (Saunders)----- (?)

Infection and Resistance, by Zinsser, 2d edition (Macmillan)----- \$4. 50

Diseases of the Heart and Aorta, by Hirschfelder (Lippincott)----- 8. 00

Basal Metabolic Rate Determination, by Boothby and Sandifund
(Saunders) ----- (?)

Medical Diagnosis, by Greene, 5th edition (Blakiston)----- 12. 00

Endocrines, by Bandler (Saunders)----- 7. 00

Nervous and mental diseases:Handbook of Mental Examinations and Methods, by Franz (Mac-
millan) ----- (?)

War Neurosis and Shell Shock, by Mott (Oxford Press)----- (?)

Physics:

Physics, by Ganot (Wood)----- 5. 00

Physiology:Physiology and Biochemistry in Modern Medicine, by MacLeod, 4th
edition (Mosby)----- 11. 00**Physiotherapy:**Treatment of Joint and Muscle Injuries, by Bristow (Henry Frowde,
London) ----- 2. 00

Nerve Wounds, by Tinel, Jules (Wood)----- (?)

Surgery:

Operative Surgery, by Binnie (Blakiston)----- 2. 00

Infection of the Hand, by Kanavel, 4th edition (Lea and Febiger) -- 5. 50

Surgical and Mechanical Treatment of Peripheral Nerves, by Stokey
(Saunders) ----- (?)

Surgical Shock, by Crile, 2d edition (Saunders)----- 6. 50

Thyroid Gland, by Crile (Saunders)----- 5. 00

Diagnosis and Treatment of Brain Injuries, by Sharpe (Lippin-
cott)----- 8. 00

Surgery—Continued.

Diseases of the Rectum and Colon, by Lynch (Lea and Febiger)---	\$6. 50
Surgery of the Upper Abdomen, by Deaver and Ashurst (Blakiston) -	11. 00
Regional Anaesthesia, by Labat (Saunders)-----	7. 00
Orthopedic Surgery, by Jones and Lovett (Wood)-----	9. 00

X ray and radium:

Injuries and Diseases of the Bones and Joints, by Baetjer and Waters (Hoeber)-----	9. 00
Roentgen Diagnosis of Diseases of the Alimentary Canal by Carman (Saunders) -----	8. 50
Roentgen Interpretation, by Holmes and Ruggles, 2d edition (Lea and Febiger)-----	(?)
X ray and Radium in the treatment of Diseases of the Skin, by Mackee, 8th edition (Chicago Medical Book Co.)-----	(?)

REFERENCE LIBRARY FOR NURSES AND HOSPITAL CORPS MEN.**Chemistry:**

Outlines of Chemistry, by Kahlenberg and Hart-----	2. 60
Pharmaceutical Chemistry, by Sadtler & Coblentz (Lippincott)---	5. 50
Organic Chemistry, by Leffman and LaWall (Blakiston)-----	(?)

Pharmacy:

Art of Compounding, by Scoville (Blakiston)-----	2. 25
Pharmaceutical Arithmetic, by Sturmer (Philadelphia School of Pharmacy)-----	1. 35
Pharmaceutical Botany, by Youngken (Blakiston)-----	3. 75

Materia medica:

Materia Medica and Therapeutics, by White and Wilcox (Blakiston) -----	4. 00
Quiz Compound on Materia Medica, Therapeutics, etc., by Potter (Blakiston)-----	2. 00

X ray:

Principles and Practice of Roentgenological Technique, by Hirsh (X ray Publishing Co., N. Y.)-----	(?)
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Hygiene and sanitation:

Preventive Medicine, by Mark F. Boyd (Saunders)-----	4. 00
Hygiene and Sanitation, by Egbert (Lippincott)-----	(?)
Field Sanitation, by Lelean (Blakiston)-----	2. 25

Physiotherapy:

Massage and Therapy Exercise, by Macmillan (Saunders)-----	2. 25
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Miscellaneous:

Elements of Physics, by Page (Keener & Co.)-----	1. 50
Bacteriology for Nurses, by Boldman and Grund, 2d edition (Saunders) -----	2. 00

4. Each hospital will immediately submit to the bureau a Form 4 requisition for such of the above-listed books as may be desired, care being exercised to avoid duplication of books already on the shelves; especial attention has been given toward securing books of value for the reference library for the use of the Hospital Corps men.

5. Please enter the cost, as given herein, in the body of the requisition, but not in the column "Value."

E. R. STITT.

Circular letter.
Serial No. 252-1923.

HWS : MFD : 130402(34).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., March 30, 1923.

To: All medical officers.

Subject: Assembling a teaching collection of Röntgenologic material.

Reference: Circular letter 187-1922.

1. The lack of Röntgenologic material, suitable in character and adequate in amount for teaching, being keenly felt at the U. S. Naval Medical School, medical officers are requested to forward to the school films that would be of value for purposes of instruction. Films that portray well the characteristics of more common lesions are desired as much as records of more unusual conditions.

2. It is requested that films be accompanied by the name, rank, and station of the medical officer forwarding them, in order that acknowledgment may be made, and that there be attached the diagnosis and any other essential data.

E. R. STITT.

Serial No. 253-1923.

WSD/JBC : 126750-0(23).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 6, 1923.

To: All naval hospitals.

Medical officer, all navy yards and naval stations.

Post surgeon, marine barracks, Quantico, Va.

Naval medical supply depot, Brooklyn, N. Y.

U. S. S. *Mercy*.U. S. S. *Relief*.

Naval Medical School.

Naval Dispensary, Navy Department.

Subject: Medical periodicals.

Reference: M. & S. circular letter, serial No. 251-1923, #126750.0(23) March 20, 1923, to hospitals only.

1. By direction of the Secretary of the Navy, all Medical Department periodicals for the fiscal year 1924 and thereafter will be subscribed for by and delivered to the bureau for distribution.

2. As directed in reference, Medical Department activities will not submit requisitions for medical periodicals for the fiscal year 1924 or thereafter, and requisitions already submitted will be canceled.

3. Standard and uniform lists of periodicals have been adapted for each Medical Department activity, and distribution will be made from the bureau in accordance therewith, beginning July 1, 1923, weekly or monthly as the case may be.

4. Medical Department activities having requisitions for periodicals for the fiscal year 1923, upon receipt of this letter will promptly notify the publishers of the various journals (also the contractor, when the journal is received other than from the publisher) to discontinue service upon termination of present subscription, which (except at the Naval Medical School and naval medical supply depot, Brooklyn) will be with the expiration of the current fiscal year,

June 30, 1923. This is most important in order to prevent future difficulty on account of claims for payment for numbers sent after expiration of subscription, as is the practice of some publishers in expectation of delayed renewals. The following form of letter is suggested:

By direction of the Secretary of the Navy, no further subscriptions for medical journals will be placed directly by this-----
----- All periodicals for the Medical Department of the Navy will be subscribed for by and distributed from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

It is therefore requested that our subscription for (name of journal) be discontinued promptly with the mailing of the last issue under present order, which terminates (June 30, 1923).

5. The standard distribution list adopted is as follows:

- (a) Naval Hospitals, Chelsea, Newport, New York, League Island, Washington, Annapolis, Norfolk, Pensacola, Great Lakes, Mare Island, San Diego, Canacao, U. S. S. *Mercy*, U. S. S. *Relief*:

Journal of the American Medical Association.
American Journal of Medical Sciences.
Surgery, Gynecology and Obstetrics.
Journal of Dental Research.
American Journal of Nursing (2 copies).
American Journal of Pharmacy.
Annals of Surgery.
Archives of Radiology and Electrotherapy.
Journal of Nervous and Mental Diseases.
Archives of Ophthalmology.
Tropical Diseases Bulletin (Canacao only).
Public Health Reports.
Naval Medical Bulletin and Supplement.

- (b) Naval Hospitals, Portsmouth, Charleston, Parris Island, Key West, Puget Sound, Pearl Harbor, Guam, St. Thomas; Naval Station, Tutuila, Samoa; Marine Barracks, Quantico, Va.:

Journal of the American Medical Association.
American Journal of Medical Sciences.
Surgery, Gynecology and Obstetrics.
Journal of Dental Research.
American Journal of Nursing (2 copies).
American Journal of Pharmacy.
Tropical Diseases Bulletin (Guam, Samoa, and St. Thomas only).
Public Health Reports.
Naval Medical Bulletin and Supplement.

- (c) Naval Hospital, Yokohama:

Public Health Reports.
Naval Medical Bulletin.
Journal of American Medical Association.
Surgery, Gynecology, and Obstetrics.
Tropical Diseases Bulletin.

- (d) Navy yards and stations:

American Journal of Medical Sciences.
Journal of American Medical Association.
Public Health Reports.

- (d) Navy yards and stations—Continued.
Journal of Industrial Hygiene (industrial yards only).
Dental Cosmos (where there is a dental officer).
Tropical Diseases Bulletin (for tropical stations).
- (e) Naval medical supply depot, Brooklyn:
Chemical Abstracts.
Druggist's Circular.
Journal of Industrial and Engineering Chemistry.
Journal of American Medical Association.
- (f) Other Medical Department activities, with two or more medical officers:
Journal of American Medical Association.
American Journal of Medical Sciences.
Public Health Reports.
Dental Cosmos (where there is a dental officer).
- (f-1) One medical officer:
Journal of American Medical Association.
Public Health Reports.
Dental Cosmos (where there is a dental officer).
- (g) Hospital Corps schools:
Journal of American Medical Association.
American Journal of Pharmacy.
Journal of American Pharmaceutical Association.
- (h) Training stations and Naval Academy:
Journal of American Medical Association.
Public Health Reports.
American Journal of Medical Sciences.
Journal of Dental Research.
Journal of American Dental Association.
Dental Cosmos.

6. Endeavor will be made promptly to forward the journals in accordance with the foregoing. Only a sufficient number of each journal has been ordered to supply anticipated requirements, however, and some variation from the list may be required, from time to time, to provide for changes or new activities.

E. R. STITT.

Circular letter.
Serial No. 254-1923.

WSD/JBC 127507(44).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 23, 1923.

To: All naval hospitals.

Senior medical officer, all yards and stations.
Naval medical supply depot.
Naval Medical School.

Subject: Change in policy of U. S. Employees' Compensation Commission regarding employees suffering from diseases; compensation law held applicable only to accidental injury.

Reference: Letter of U. S. Employees' Compensation Commission, April 16, 1923.

1. The above-mentioned letter is quoted for your information with regard to civilian employees of the United States applying for treatment under the

compensation law. (Pars. 1159-1166 and 1910, Manual for the Medical Department, 1922.)

"Reference is made to a recent alteration in policy, perhaps temporary, in regard to the treatment of employees of the United States Government injured in the performance of their duty. This has been made necessary by a recent decision of the Comptroller General of the United States, as explained in the following paragraphs:

"1. From the enactment of the Federal compensation act, September 7, 1916, the commission has construed the term 'personal injury' as used in the law to cover disability resulting from injury by accident and also any disease if directly caused by the employment. However, the Comptroller General of the United States in a recent decision has held that the compensation law applies to cases of accidental injury only.

"2. When the construction of the law which the commission has followed since its enactment in 1916 was questioned by the Comptroller General and the matter was brought to the attention of Congress, the House passed an amendment defining 'personal injury' in the compensation law as including 'disease proximately caused by the employment,' the express object of which was to make the law conform to the construction that had been placed upon it by the commission. In the Senate there was considerable support to this view. Some Senators, however, took the position that the time was insufficient for proper consideration of the question and that it should go over until the meeting of the new Congress in December. It was finally agreed, therefore, in the amending act of March 3, 1923, that the awards already paid by the commission should be allowed to continue until March 1, 1924, unless otherwise determined by the commission, thus giving Congress time to act after more deliberation than was possible during the session which has just closed.

"3. It is expected that the amendment of the law to make clear the intent of Congress with reference to the compensation of disease directly caused by the employment will be taken up by Congress when it again meets in December. In the meantime the commission does not feel warranted in paying compensation or authorizing any medical or hospital treatment except on account of the results of an accident.

"From the above it will be clear to official superiors that until further notice, employees suffering from diseases alleged to be the result of occupation rather than of accident, should not be referred for treatment on Form CA-16 or for examination on Form CA-17 to Government or designated physicians. For your further guidance in order to more closely differentiate between occupational disease and accident, it may be stated in general that disabilities from single injuries occurring within a relatively brief space of time may be termed accidental and referred for treatment. On the other hand, disabilities arising from conditions of employment distributed over a time in excess of one day must, as a rule, be considered nonaccidental in nature and until further notice can not be referred for treatment or examination. These cases, however, should be reported to the commission on Form CA-2 in order that at a later date they may receive further consideration in case Congress so amends the compensation act next year so as to include diseases of an occupational nature. Claimants are further recommended to forward Form CA-4 for the same reason, if medical expenses have been incurred or wages lost."

E. R. STITT.

Circular letter.
Serial No. 255-1923.

WSD/JBC 124942-0.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 24, 1923.

To: All naval hospitals, continental limits and Pearl Harbor.

Naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.

Naval Medical School, Washington, D. C.

Post surgeon, marine barracks, Quantico, Va.

Senior medical officer, navy yards and stations, continental limits.

Subject: Revised schedule of wages for civil employees under the Naval Establishment.

Inclosure: One copy of revised schedule.

1. The wage scales of the inclosed schedule become effective on May 1, 1923, for all civilian employees of the Naval Establishment at Medical Department stations within the continental limits of the United States and at Pearl Harbor.

2. No change is made in rates of pay for employees of the Hospital Service, excepted group or reconstruction aide group, but numerous changes appear in the laborer, helper, and mechanical service, where a departure is made from the previous policy of uniformity of wage for the same ratings at all stations. Changes also appear in the clerical service.

3. The activities addressed by this letter will immediately submit requests for allotments for the balance of the fiscal year 1923 (May and June) to cover the difference between present pay and the rates effective May 1, 1923 (unless present allotments show a sufficient monthly balance to render an additional allotment unnecessary, in which case report will be made to that effect). The requests will show the increase required under each subhead, as well as the total increase and increase in monthly allotments.

4. Separately, and not later than ten days from the receipt of this letter, all activities will submit new requests for allotments for the fiscal year 1924, covering pay of the civil force under "Maintenance and operation (labor)" and "Administration (clerical)." In submitting these requests, the distribution of employees under each subhead will be shown in the following form, calculations being based on maximum pay:

	Pay per month.	Total.
(a) Transportation:		
3 chauffeurs.....	\$106. 08	\$3, 818. 88
1 machinist.....	153. 92	1, 847. 04
		5, 665. 92
(b) Power house:		
1 engineman.....	160. 16	1, 921. 92
4 firemen.....	122. 72	5, 890. 56
		7, 812. 48
(c) Commissary:		
1 chief cook.....	110. 00	1, 320. 00
Etc.		
(d) Laundry:		
1 chief launderer.....	130. 00	1, 560. 00
Etc.		
(e) Buildings and grounds:		
1 chief mechanic.....	228. 80	2, 745. 60
Etc.		

5. Allotments for civil force which have been sent out by the bureau for the fiscal year 1924 (except for reconstruction aide group, or for clerical force where the new schedule makes no change) will be returned for cancellation.

6. Attention is invited to instructions on pages 3 and 20 of the schedule regarding promotion of clerical force under classifications C and D after six months' service. Those now in the service who have served satisfactorily six months or more will be promoted as of May 1, 1923, as follows:

Class D, from \$93.60 to \$104.

Class C, from \$104 to \$114.40.

7. On page 18, par. 31, it will be noted that the increment for supervisory employees remains at 15 cents per hour for chief mechanics and 5 cents per hour for assistant chief mechanics, head mechanics, etc. Attention is called to the fact, however, that the pay of these supervisors is not necessarily uniform, but depends on the pay of the basic trade. Thus a chief mechanic at Chelsea, promoted from electrician, would receive \$228.80 per month, while if promoted from machinist his monthly pay would be \$178.88.

8. Report will be submitted, with requests for 1924 allotments, on plain 8 x 10½ paper, in duplicate, showing the increased cost of the new schedule for the employees in each rating, arranged in one list by groups, as follows:

GROUP I.

Rating.	No.	Old pay per month.	New pay per month.	Total old pay.	Total new pay.
Janitor.....	2	\$85. 28	\$89. 44	\$170. 56	\$178. 88
Laborer.....	1	85. 28	89. 44	85. 28	89. 44

Groups II, III, IV(a), and IV(c) will be in the same form, with totals for last two columns.

E. R. STITT.

Circular letter.
Serial No. 256-1923.

JWR: GA 125949(44).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 25, 1923.

To: All naval hospitals.

Subject: Subsistence of marines.

Reference: M. & S. circular letter, serial No. 205-1922.

1. On account of a difference in the method of obtaining reimbursement for marines subsisted in naval hospitals, the bureau finds it necessary to have additional data entered on the Ration Memoranda, submitted monthly, in accordance with instructions contained in above circular letter (ref.).

2. It is requested, therefore, that hereafter the entries under "Patients" in the columns under "Marine Corps" the number of patients be separated to indicate the number of subsistence days for marines admitted from shore stations and the number of subsistence days for marines admitted from vessels in commission. This can be done by writing after the respective figures the entries "Admitted from shore stations" and "Admitted from vessels."

3. It is also requested that each hospital immediately furnish the above information for each month since September, 1922, that the bureau may correct reports already forwarded for those months.

F. L. PLEADWELL, Acting.

Circular letter.
Serial No. 257-1923.

WEE: SS 124680(44).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 25, 1923.

To: All medical officers.
Subject: Vaccination records.

1. Attention is directed to Section V of chapter 14 on page 224 of the Manual for the Medical Department, 1922, paragraphs 2301 to 2304. It is desired that all medical officers shall comply with the provisions of these paragraphs.

2. It has been brought to the attention of the bureau that men are received at training stations and elsewhere from other training stations, from ships, and from other places without proper entries being made relative to vaccination both as to cowpox vaccinations and typhoid and antityphoid inoculations. Furthermore, it is reported, and it also appears from records on file in the bureau, that medical officers have not entered the written signature or initials in the vaccination records and abstracts of the health records, but, rather, a rubber stamp has been used. It is desired that medical officers shall sign these records or, if a rubber stamp is used, that they shall initial such records.

3. The bureau desires further to point out the importance of this matter with regard to the health records in that the provisions of law with which the bureau must deal require that careful and specific records be kept.

E. R. STITT.

Circular letter.
Serial No. 258-1923.

WSG 125282-0(44).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 26, 1923.

To: All naval hospitals;

All naval medical supply depots;

Naval Medical School; and

Naval dispensaries, navy yards, at Portsmouth, N. H., League Island, Charleston, Puget Sound, Boston, Mass., Washington, Pensacola, Mare Island, Brooklyn, N. Y., Norfolk, Key West, Cavite.

Subject: (a) Reports of Surgeon General, 1918, 1919, 1920.

(b) Naval Digest, 1921.

(c) Naval Yearbook, 1920 and 1921.

1. By separate inclosure the bureau is forwarding the above-mentioned three publications.

2. The bureau's reports (a) for the three years covering the World War period have been bound into one volume for their better and surer preservation; in consideration of the valuable vital statistics and other important data of the war, available nowhere else, this volume should be carefully preserved in the library, and it should be so marked with the name of the library that it may not be lost.

3. The Naval Digest (b) is being distributed only to the hospitals, depots, and the school; it has been prepared in the office of the Judge Advocate General of the Navy, and is published for use in connection with the Naval Digest, 1916; it should be made so available as to become familiar to all members of the staff.

4. The Yearbook (c) has been supplied to Medical Department activities for many years; it contains all naval appropriations, some naval deficiency appropriations, and much naval legislation enacted since the beginning of the rehabilitation of the Navy through the act of March 3, 1883; the present volume does not replace those volumes which have preceded it, for the reasons given in the "Prefatory note" on page 3; the full set of these books should, therefore, be preserved.

E. R. STITT.

Circular letter.
Serial No. 259-1923.

WSD/JBC 124942-O.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., April 27, 1923.

To: All naval hospitals, continental limits, and Pearl Harbor.

Naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.

Naval Medical School, Washington, D. C.

Post surgeon, marine barracks, Quantico, Va.

Senior medical officer, Naval Training Station, Hampton Roads, Va.

Subject: Schedule of wages for civil employees effective May 1, 1923, modification of.

Reference: (a) M. & S. circular letter, serial No. 255-1923, #124942-O, April 24, 1923.

(b) Alnavsta two, April 26, 1923.

Inclosure: Alnavsta three.

1. Reference (b) reads:

"0526. This Alnavsta applies only to stations within continental limits of United States and Pearl Harbor. Reports from various navy yards have convinced the department that the recent changes in the wages of certain trades in private industrial establishments in various localities since wage data was collected render it advisable that the wage schedules just promulgated which become effective May first be revised. Wage boards will therefore be convened at the various yards to collect new data for groups one, two, and three and recommend a revised scale which will go into effect July first and continue until the first of the year. Pending revision of the wage scale effective May first no reductions will be made from the scale effective September sixteenth, nineteen twenty-one. The proceedings of the wage boards will be under the new regulations being mailed this date 1250."

2. The intent of this order is to make effective as of May 1, 1923, all increases carried in the new schedule, but to suspend the operation of all decreases until the promulgation of an additional revision which will become effective July 1, 1923.

3. Employees for whom the schedule approved April 14, 1923, carries an increase in pay will be advanced to the new rate on May 1, 1923; but where a decrease in pay is shown, or where the rating has been omitted, present pay rates will be continued until the receipt of further instructions. It will be noted that there is no change in the method of computing the monthly pay of employees at hospitals (par. 30 of the schedule), including employees at the sick quarters, Quantico, and Hampton Roads.

4. In submitting requests for allotments for the months of May and June, 1923 (par. 3, ref. a), calculations will be on the above basis, i. e., allow all increases but make no decreases in pay.

5. As it is impracticable to withhold allotments for the fiscal year 1924, until the receipt of revisions in the schedule to become effective July 1, 1923, the allotment requests called for in par. 4, ref. a, will be forwarded, computed on the same basis as allotments for May and June, 1923.

6. The report called for in par. 8, ref. a, also will be submitted.

E. R. STITT.

Circular letter.
Serial No. 260-1923.

CBM-EJP 127039 (51).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 2, 1923.

To: All medical officers.

Subject: Vacancies in the Naval Medical Corps.

1. The bureau again desires to call to the attention of all medical officers the shortage of officers in the corps and to urge upon all members of the corps, especially those officers on duty in medical centers and near class A medical colleges, the necessity for renewed efforts to interest young medical men in the Navy.

2. In order that medical officers may be familiar with the situation in the corps as it exists at present, the following information is submitted:

3. Appropriation has been made for 800 medical officers for the fiscal year 1923-24. The present strength of the corps is 746. There are 22 candidates who have qualified for appointment in the grade of assistant surgeon, rank of lieutenant (junior grade), 18 of whom are senior students in Class A medical colleges and can not be commissioned until after graduation in June.

4. The last computation, made on November 15, 1921, was based on 815 medical officers, which allowed—

4 rear admirals.

34 captains.

65 commanders.

There are at present in the upper grades of the Medical Corps—

4 rear admirals.

33 captains.

63 commanders.

The bureau is informed that a new computation will have to be made on or before July 1st of this year. Should all candidates who have qualified accept their commissions the strength of the corps would then be 768. Computing on this number the corps would be allowed—

4 rear admirals.

32 captains.

61 commanders.

5. It will be noted, therefore, that unless the bureau is successful in recruiting the corps up to 800 on or before July 1st there will be no promotion in the upper grades, as the present numbers are in excess of the numbers which would be allowed by computing on a strength of 768.

6. Several officers of the corps have done excellent work in securing candidates for the corps from among senior students of class A medical colleges, and it is believed that with a little effort on the part of medical officers on duty in medical centers and in the vicinity of medical colleges a sufficient number of qualified candidates could be secured to increase the number in the corps up to that appropriated for, 800.

7. The bureau has during the past year made every effort to recruit the Medical Corps to the appropriated strength. The Surgeon General has personally addressed about 12,000 letters to physicians within the statutory age limits for appointment who are graduates of recognized medical schools, and, in addition, has written personal letters to each intern serving in hospitals recognized by the American Medical Association. He has also written personal letters to each member of the senior classes of class A medical schools, conveying information regarding the Medical Corps of the Navy. A plan has been adopted whereby appointees to the Medical Corps direct from medical schools will be assigned to the larger naval hospitals for one year in order to meet the requirement of a year's internship.

E. R. STITT.

N64-GWL 6085-178.

NAVY DEPARTMENT,
BUREAU OF NAVIGATION,
Washington, D. C., 10 May, 1923.

Bureau of Navigation circular letter No. 31-23.

To: All ships and stations.

Subject: Examination of enlisted men for appointment to the following warrant grades: Pharmacists, gunner (ordnance), gunner (electrical), gunner (radio).

Reference: (a) Bureau manual, chapter 6, Articles D-5100-5849.

(b) N. Nav. 334, report of preliminary examination.

(c) N. Nav. 78, 1919, instructions to examining boards.

1. A competitive examination for appointment to the rank of pharmacist and to that of gunner (ordnance, electrical, and radio) will be held the week commencing 20 August, 1923. Vacancies exist for 17 pharmacists and for 72 gunners (ordnance), 29 gunners (electrical), and 58 gunners (radio).

2. The preliminary examination of candidates, as required by reference (a), shall be held by commanding officers in ample time to permit reports to reach the bureau prior to 15 July, 1923. Applications received subsequent to that date will not be considered. All applications must be submitted on N. Nav. 334 and must be accompanied by a transcript of the candidate's current service record.

3. Eligibility requirements for this examination are outlined in paragraphs D-5118, Pharmacists, and D-5115, Gunners, all classes. In addition, a report of insobriety or unexcused absence committed subsequent to 20 August, 1921, disqualifies any candidate.

4. All officers designated in the Navy Department letter 26251-439 of 11 April, 1921, and supplements thereto, are requested to appoint such boards as may be necessary to supervise the final examination of candidates for promotion. These boards should be convened in ample time to permit the commanding officers of candidates to ascertain before which board candidates shall appear.

5. Particular attention is invited to the provisions of Article D-5132, bureau's manual, in order that sufficient sets of questions may be forwarded by the naval examining board, Washington, D. C. In the case of the pharmacist examination, the questions will be prepared and forwarded by the naval examining board, Naval Medical School, Washington, D. C.

6. In the case of candidates who are serving on unattached vessels or stations, they shall be transferred to a ship or station where a board has been convened for temporary duty in connection with the final examination. They

shall return to their regular stations and duties upon completion of this examination.

7. In the event that a candidate is transferred after he has received authorization to appear for examination, the commanding officer will forward the authorization to the candidate's commanding officer so that every opportunity will be afforded the man to present himself before the nearest supervisory board.

R. H. LEIGH, *Acting.*

Circular letter.
Serial No. 261-1923.

WRJ-ML:125884(23)

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 7, 1923.

To: All medical officers, pharmacists, and Hospital Corps men on independent duty.

Via: Official channels.

Subject: Accounting system for ships and stations.

Inclosure: Outline of system.

1. Beginning July 1, 1923, there will be placed in operation at all stations and on board all ships where any Medical Department property is in use, the system of accounting for Medical Department property and expenditure of supplies outlined on inclosure.

2. The system has been made as simple as will secure results. With proper supervision by the medical officer or pharmacist, it will require little more than accurate and painstaking work.

3. In order to economize, that is, to practice economies that are of definite value, it must be known just what is being done at the present time, how it is being done, how it compares with other ships or stations, and the results obtained. If this is not known, any effort to economize is not based on sufficient knowledge to secure results.

4. The reports from ships and stations at the present time are based entirely on cash expenditures; that is, the amount drawn from the medical supply depots, the supply department, or paid on public bills, and, therefore, represent simply bills paid in the year. No allowance can be made for differences in the amount of stores on hand, additional equipment, or other items that should not be charged to current expenses.

5. The system provides means for reporting *actual* receipts and *actual* expenditures over a certain period of time. It will be noted that the actual receipts bear no relation to the amount charged to current expenditures, but are carried as nonexpendable and expendable supplies on hand until actually expended. Reports prepared on this basis will inform the bureau as to the actual cost of maintenance for a given period of time; also as to the value of supplies remaining on hand.

6. The system outlined on inclosure does not replace the present system of allotments and reports of expenditure as these reports are necessary for the administration of current appropriations.

7. Requests for a small initial supply of the new forms, "Report of Medical Department receipts and expenditures" and "Issue voucher," will be made on the naval medical supply depot, Brooklyn, N. Y. It will be noted that destroyers and other small craft, recruiting stations, and other very small stations will not be required to use the "Issue voucher." Destroyers and small craft will not be required to submit individual reports, as such reports will be submitted by the tender.

E. R. STITT.

ACCOUNTING SYSTEM FOR THE MEDICAL DEPARTMENT OF SHIPS AND STATIONS, IN
EFFECT JULY 1, 1923.

1. The present system of allotments and reports of expenditures required by section 2 of chapter 20 of the Manual of the Medical Department will continue in force, and the system described herein will be in addition thereto.

2. Stock cards for both nonexpendable and expendable property will be brought up to date by an actual inventory. All equipment not on charge or on charge without price will be appraised at its replacement value and accounted for. If for any reason it is impossible to ascertain the value of any item, it is directed that a list of such items, with blank space for price, be forwarded to the bureau, where the value will be entered.

3. It must be remembered that many items used by the medical department of ships and stations are not the property of the Medical Department. On board ships such items as typewriters, sterilizers (except dental electric), incubators, Stoke's splint stretchers, mattresses, pillows, mattress covers, pillow covers, etc., usually are not Medical Department property, but are under the cognizance of other bureaus. Probably the best guide for determining whether or not property used by the Medical Department is Medical Department property is the Supply Table. As a rule, articles not listed on the Supply Table will not be taken up as Medical Department property, except where additional items, such as X-ray equipment, cases of trial-test lenses, etc., are issued by the medical supply depot. No definite rule can be given for determining the status of property in use at navy yards and stations, but generally all property other than buildings and appurtenances should be taken up as Medical Department property. (See paragraphs 3009 and 3010, Manual of the Medical Department.) In preparing inventory cards care will be exercised in order that no property is included except that belonging to the Medical Department. It is very important that the medical officer or pharmacist personally supervise the preparation of this inventory, in order that the reports submitted to the bureau will show the cost value of both nonexpendable and expendable property on hand.

4. The inventory prepared as of July 1, 1923, will show the actual amount and value of nonexpendable property and the value of expendable property by classes. Should the actual inventory not agree with the present stock cards a survey will be held and submitted, with the annual inventory, as a voucher to show why items have been expended. *Returns will show the actual number and value of nonexpendable items and value only of expendable items on hand. When items are missing they will be expended from the books and will not be included in returns.* (See Survey of missing articles.)

5. The senior medical officer will be held to a strict accountability for medical stores placed in his charge, but for the purpose of inventory he may require a junior medical officer (or pharmacist, see paragraph 6) to personally supervise the taking of the inventory and sign the certificate on the "Report of Medical Department receipts and expenditures." If the certificate is signed by another than the senior medical officer the senior medical officer will "approve" the report before submission to the bureau.

6. On board ships or on stations to which a chief pharmacist or pharmacist is attached he will be detailed as property and accounting officer in addition to such other duties as it may be desirable that he should perform to fit the requirements of the particular ship or station. The pharmacist so detailed shall be accountable to the senior medical officer for all equipment and stores in his charge, exercising personal and careful supervision over their condition and the economical expenditure thereof, reporting any deficiencies to the senior

medical officer. The pharmacist so detailed will sign the certificate on the "Report of Medical Department receipts and expenditures," which will be approved by the senior medical officer before submission to the bureau.

7. "When stores and supplies are transferred from the charge of one medical officer to another, triplicate receipts must be passed.

"Whenever a medical officer is relieved from duty, he shall transfer to his successor all public property in his charge.

"When a Hospital Corps man has been placed in charge of property of the Medical Department, on his relief from duty he shall transfer to his successor all public property in his charge." (Art. 1171, N. R.)

8. Until the issue of the new front sheets, Form D, a notation similar to the following example will be made on the face thereof when a medical officer, or Hospital Corps man, transfers public property to his successor:

Nonexpendable property-----	\$10,000.00
Expendable property-----	15,000.00

Value of property receipted for-----	\$25,000.00
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9. New Form Da will be issued prior to the 1st of July and will be used in submitting the yearly inventory of property. This form has been changed to include the value of property in addition to number of items. In addition to listing nonexpendable property, expendable property will be listed by classes, as outlined in Supply Table, with money value only. Example:

Expendable supplies.

Medicines-----	\$5,000.00
Antiseptics and disinfectants-----	500.00
Tablets-----	800.00
Hospital stores-----	250.00
Etc.	
Etc.	

Total-----	\$8,550.00
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10. The bulk of all medical supplies will be kept in the medical storerooms and the quantity in the dispensary or sick bay kept as low as may be consistent with actual requirements.

11. Subject to the provisions of article 1145, Navy Regulations, the medical officer will place the storerooms in charge of a competent Hospital Corps man, who will receipt in writing for all stores placed in his charge and who will, on approved "Issue voucher," make such issues as are required in the operation of the Medical Department. Issues from storerooms will be made only by the Hospital Corps man having charge thereof.

12. An inventory of all stock in storerooms and nonexpendable property in use will be made at the close of each quarter and upon detachment of the senior medical officer. An inventory of supplies in storerooms will also be made upon the relief of the Hospital Corps man in charge.

13. In order that strict accountability may be established, no one other than the Hospital Corps man in charge of the storeroom shall be allowed access thereto except in cases of urgent necessity. When it is necessary to admit others to the storerooms for stowing, cleaning, etc., the Hospital Corps man in charge will always be present.

14. Expendable supplies will be issued only from the storerooms upon the approval of an "Issue voucher" by the senior medical officer, and in his absence by the next senior or by the pharmacist. The "Issue vouchers" are printed in triplicate. The primary reason for having these vouchers is to inform the senior medical officer as to the actual amount of stores brought from storerooms, and, secondly, to hold the storeroom keeper responsible for the amount of stores on charge.

15. The new form "Issue voucher" will be issued, when printed, to all Medical Department activities, except destroyers or other vessels that have such small quantities of stores as to make it impracticable to use this form. When stores are required from the storeroom the form will be prepared and, when signed, the first will be delivered to the Hospital Corps man in charge of the storeroom and will be his authority for issue. When issues have been made and the voucher signed by person receiving the supplies the first will be returned to the office. The three vouchers will then be priced and the second will be retained by the medical officer for use as a check at the end of the quarter. The first will then be filed until the end of the month, when issues will be consolidated and entered on the stock cards. The third will remain in the bound pad as a further check on issues.

16. *Record book of receipts and expenditures.*—An ordinary blank book, foolscap size, as issued by the supply depot, will be ruled as noted on the attached sheet. In this book will be recorded the value of all receipts and expenditures as they occur and under the various headings indicated. At the end of the quarter the sum totals of the various headings will be carried to corresponding headings on the quarterly report.

17. *New unit price.*—When new supplies are received and there are like supplies in stock with different unit price, the value of the supplies will not be changed, but a new unit price will be obtained as shown in the following example: On June 30 there were on hand 10 bottles of acacia, unit price \$0.50 per bottle, making a total value of \$5; on July 1, 10 additional bottles were received from the supply depot with a unit price of \$1 per bottle, or a total value of \$10; we then have 20 bottles with a total value of \$15, making the new unit price \$0.75 per bottle.

18. *Report of Medical Department receipts and expenditures.*—(a) When submitted.

The report will be submitted not later than the 15th day of the month following the close of each quarter.

(b) By whom submitted.

The report will be submitted by every activity to which a representative of the Medical Department is attached. In the case of destroyers, submarines, and other small craft attached to destroyer or submarine bases or tenders, the report of the base or tender will include the report of the whole division. The combined report will show clearly just what activities are covered therein. The report of main recruiting stations will include the report of all sub-stations.

(c) To whom submitted.

The Bureau of Medicine and Surgery.

(d) Number of copies submitted.

The ribbon copy only will be submitted.

(e) What receipts and expenditures shall be shown on the report?

All receipts of both nonexpendable and expendable supplies, when chargeable to appropriations under the cognizance of the Bureau of Medicine and

Surgery, shall be shown. Supplies received as a charge to an appropriation under the cognizance of other bureaus will *not* be included.

(f) What appropriations are under the cognizance of the Bureau of Medicine and Surgery?

Appropriation: "Medical Department"; "Contingent, M. & S."; "Bringing home remains, etc."; "Care of hospital patients"; "Naval hospital fund."

(g) Are all the above appropriations available for expenditure on ships and stations?

The appropriations, "Medical Department"; "Contingent, M. & S."; and "Bringing home remains, etc.," are available for expenditure upon approved requisitions or allotment cards. The appropriation "Care of hospital patients" will be used only when specifically authorized by the bureau. The "Naval hospital fund" is never available for expenditure on ships and stations.

(h) What is the general scope of the appropriations available for expenditure on board ships and stations?

The appropriation "Medical Department" is available for the purchase of special diets for the sick and for medicines. "Contingent" is available for the purchase of special articles required for stations and for laundry on ships and stations. (See sec. 4 of chap. 1 of the Manual for the Medical Department.)

(i) When shall nonexpendable items be expended?

When surveyed as missing or upon approved survey as unfit for use.

(j) When shall expendable items be expended?

Expendable items, when issued from the storeroom, will be shown as expended.

(k) Shall any information be placed on the reverse of the report of receipts and expenditures?

Information will be supplied on the reverse of the report showing the numbers and amounts of supply depot requisitions, public bills, stub requisitions, etc., that make up the amounts shown under original acquisitions. The number and amount of each survey will also be shown.

19. The headings appearing on the "Report of Medical Department receipts and expenditures" are explained as follows:

Non expendable supplies.—Nonexpendable supplies include all equipment employed in the operation of the medical department of the ship or station except material used by the medical department that is furnished by other departments of the Navy. The supply table will be used as a guide in determining expendable and nonexpendable supplies. Items on hand not shown in the supply table will be classed as nonexpendable when by their nature they are similar to articles shown on the supply table as nonexpendable.

Balance from previous quarter.—The amount shown under this heading will be, for the report submitted as of July 1, 1923, the value of all nonexpendable supplies on hand as shown by actual inventory; for following quarters the amount will be that shown under "Balance to next quarter" for the preceding quarter.

Receipts.—This classification includes all the receipts of nonexpendable property from all sources.

Original acquisition.—Under this heading will be shown all original receipts of nonexpendable supplies (except Medical Department property received from other ships or stations), as under—

Medical supply depots: The value of all nonexpendable supplies received from medical supply depots will be shown under this heading.

Supply department: The value of all nonexpendable supplies received from the supply department of the ship or station chargeable to Medicine and Surgery appropriations will be shown under this heading.

Open purchase (public bills): The value of all nonexpendable supplies purchased in the open market and paid for on public bills charged against a Bureau of Medicine and Surgery appropriation will be shown under this heading.

Transfer: The invoice value of all nonexpendable Medical Department property received by transfer from other ships or stations will be shown under this heading.

Total: The amount shown under this heading will be the total of the amount brought forward from the previous quarter, the value of the original acquisitions during the quarter, and of property received by transfer during the quarter.

Expenditures.—Includes the expenditure of nonexpendable property as under—

Final expenditures: When property has been actually expended from books by approved survey or surveyed as missing.

Transfer: Transfer of nonexpendable property to—

Other ships or stations: Receipted Form D showing invoice value will accompany quarterly reports when property is transferred to another ship or station.

Total expenditures: Value of property surveyed and transferred to other ships and stations.

Balance to next quarter.—The amount shown under this heading will be the difference between "Total receipts" and "Total expenditures." This amount will be shown on next quarterly report as "Balance from previous quarter."

Total.—The amount shown under this heading will be the sum of "Total expenditures" and "Balance to next quarter," and will balance with "Total receipts."

Expendable supplies.—Expendable supplies include all supplies consumed in the operation of the medical department of the ship or station that can not be charged to a nonexpendable heading. The Supply Table will be used as a guide for determining expendable supplies.

Balance from previous quarter—Receipts—Expenditures.—Same as under nonexpendable heading except that only expendable supplies will be included.

Expendable Form B supplies, medical.—Under this heading will be included all supplies received from the supply depot or like supplies purchased in open market or received by transfer from other ships or stations, and which have been expended for use by the Medical Department proper.

Expendable Form B supplies, dental.—Includes all supplies issued to the dental division. Includes medicines, dressings, etc., issued from Medical Department stock as well as strictly dental supplies.

Special diets.—The amount expended for special diets during the period covered by this report. This does not include special diets prepared from soups, etc., furnished by the medical supply depots.

Laundry.—The actual amount expended for laundry during the period covered by this report. Includes the cost of laundry work performed by ships laundry or by civilian laundry.

Ambulance service.—The cost of repairs, gasoline, oils, tires, etc., if paid for by Medical Department appropriations. When ambulances are maintained and operated by the navy yard or station garage there will be no charges to Medical Department appropriations.

Ice.—The cost of ice when paid for from Medical Department appropriations. Ice, except when used by the medical department of stations for the preservation of food or biologicals, will not be a charge to Medical Department appropriations. No ice furnished medical departments of ships will be made a charge to this heading.

Civil employees.—The amount actually paid all civil employees during the period covered by the report as under—

Clerical: The amount paid for clerical force.

Other: The amount paid employees other than clerical.

Miscellaneous.—This heading will include any expenditures not properly chargeable to any of the above headings. ¶See paragraphs 3005 and 3014, Manual of the Medical Department.)

Total expenditures.—A recapitulation of expenditures shown under both non-expendable and expendable headings.

Average complement.—The average Navy and Marine Corps complement for the period covered by the report.

Average cost per diem based on average complement.—Obtained by multiplying the average complement by the number of days in the quarter and dividing the "Actual expenditures chargeable to ship or station" by the sum so obtained.

Example:

Average complement, 1,000; number of days in quarter, 92; $1,000 \times 92 = 92,000$; actual expenditures, \$2,300; $\$2,300 \div 92,000 = \0.025 , the average cost per diem based on average complement.

Report of Medical Department receipts and expenditures, U. S. ———, for the quarter ended ———.

NONEXPENDABLE SUPPLIES.

Balance from previous quarter..... \$15,000.00

Receipts:

Original acquisitions—

From medical supply depot.....	\$1,000.00	
From supply department.....	100.00	
From open purchase (public bills).....	25.00	
		1,125.00

By transfer—

From other ships or stations.....	100.00	
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Total		16,225.00
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Expenditures:

Final expenditures—

By survey.....	225.00	
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By transfer—

To other ships or stations.....	100.00	
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Total expenditures.....	325.00	
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Balance to next quarter.....	15,900.00	
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Total		16,225.00
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EXPENDABLE SUPPLIES.

Balance from previous quarter..... \$22,000.00

Receipts:

Original acquisition—

From medical supply depot.....	\$2,000.00	
From supply department.....	300.00	
From open purchase (public bills).....	100.00	
From pay roll (civilian).....	250.00	
		2,650.00

By transfer—

From other ships or stations.....	150.00	
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Total		24,800.00
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Expenditures:**Final expenditures—**

Expendable Form B supplies, medical.....	\$850. 00
Expendable Form B supplies, dental.....	400. 00
Special diets.....	50. 00
Laundry.....	50. 00
Ambulance service.....	100. 00
Ice.....	25. 00

Civil employees—

Clerical.....	\$100. 00
Other than clerical.....	150. 00
	<u>250. 00</u>

Care of the dead..... 25. 00

Miscellaneous..... 200. 00

By transfer— \$1, 950. 00

To other ships or stations..... 250. 00

Total expenditures..... 2, 200. 00

Balance to next quarter..... 22, 600. 00

Total..... 24, 800. 00

TOTAL EXPENDITURES.

Nonexpendable supplies..... \$325. 00

Less—

Transfers..... 100. 00

225. 00

Expendable supplies..... 2, 200. 00

Less—

Care of dead..... \$25. 00

Transfers..... 250. 00

275. 00

1, 925. 00

Actual expenditures chargeable to ship or station..... 2, 150. 00

Average complement..... 1, 000

Average cost per diem based on average complement..... \$0. 023

Number treatments civil employees..... 1, 240

[Reverse of "Report of Medical Department receipts and expenditures."]

The following information will always be shown on the reverse of form in order that the amounts reported as receipts and expenditures may be checked with requisitions, public bills, and surveys on file in the bureau.

Receipts:**S. D. Req.—**

No. 1..... \$850. 00

No. 2..... 1, 300. 00

No. 3..... 800. 00

E. I. S. 300-46..... 50. 00

¹ \$3, 000. 00

Stub requisition—

No. 1..... 250. 00

No. 2..... 100. 00

No. 3..... 50. 00

¹ 400. 00

¹ Amounts must correspond with those of face of report.

Receipts—Continued.

O. P. Req.—

No. 1—Public bill No. 1.....	\$25. 00	
No. 2—Public bill No. 1.....	60. 00	
No. 3—Public bill No. 1.....	40. 00	
		¹ \$125. 00

Pay roll—

July.....	83. 00	
August.....	85. 00	
September.....	82. 00	
		¹ 250. 00

From transfer—

Naval hospital, Norfolk, Va.....	200. 00	
N. O. B., Hampton Roads, Va.....	50. 00	
		¹ 250. 00

Expenditures:

By survey—

No. 1.....		¹ 225. 00
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By transfer—

U. S. S. <i>Florida</i>	100. 00	
U. S. S. <i>New York</i>	250. 00	
		¹ 350. 00

[Method for ruling "Record book of receipts and expenditures," par. 16.]

(Left-hand page.)

NONEXPENDABLE.

RECEIPTS.

Date.	Medical supply depot.	Supply department.	Open purchase (public bill).	Other ships or stations.

SUPPLIES.

(Right-hand page.)

EXPENDITURES.

Date.	Survey.	Other ships or stations.	

(Left-hand page.)

EXPENDABLE.

RECEIPTS.

Date.	Medical supply depot.	Supply department.	Open pur- chase (P. B.).	Pay roll (civilian).	Other ships or stations.	

¹ Amounts must correspond with those of face of report.

SUPPLIES.

EXPENDITURES.

(Right-hand page.)

Date.	Form B, medical.	Form B, dental.	Special diets.	Laundry.	Ambulance upkeep.	Ice.	Civilian, clerical.	Civilian, others.	Other ships or stations.	Care of dead.	Miscellaneous.	

Circular letter.
Serial No. 262-1923.

WRJ-ML : 132609-0(51).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 7, 1923.

To: All medical officers, pharmacists, and Hospital Corps men on independent duty.

Via: Official channels.

Subject: Survey of Medical Department property.

Inclosure: Copy of instructions.

1. Beginning July 1, 1923, there will be placed in operation at all hospitals, stations, and on board ships where any Medical Department property is in use, the instructions outlined below.

E. R. STITT.

SURVEY OF MEDICAL DEPARTMENT PROPERTY.

Request for survey.—Requests for survey of Medical Department property will be prepared in quintuplicate on M. & S. Form Ca. For each item there will be entered on these requests the item number, quantity, name of the article, date of receipt, purchase price, and a concise statement of the reasons for requesting its survey.

All sheets shall be typewritten whenever possible, and great care must be exercised to insure correctness of figures when quoting purchase price in order that such figures, when the survey has been approved, will agree with accounting figures sent to the bureau. If such care is not exercised, the accounting books will lose their balance and difficulties will be encountered.

When nonexpendable and expendable supplies are damaged by fire or other unusual occurrence a separate request for survey will be prepared covering only the articles so damaged.

Requests for survey may be made at any time that may be necessary but as a rule not less frequent than every six months and before the commanding officer of a naval hospital or the medical officer of a ship or station is detached. When articles are lost or missing, a request for survey will be immediately prepared and forwarded.

Requests will be numbered consecutively, beginning a new series with each fiscal year.

"In case of loss or such damage as to unfit supplies for issue, or articles of equipment for further use, the officer in whose charge they are shall request a survey for the purpose of establishing and reporting the facts. If lost, the articles shall be expended from the books, but the accountability of the officer responsible for the loss shall not thereby be diminished, and the boards

of survey shall ascertain and report thereon; but if they are so damaged as to be unfit for further Government use in their original capacity, and are to be turned into store, they shall remain on the books until they can be turned in, when they shall be invoiced at their appraised value to a supply officer on shore." (N. R. 1389.)

Articles will not be surveyed except when absolutely *unfit for any use* by the Medical Department, or when in excess or to be turned in for repairs. In other words, articles unfit for use in original capacity will not be surveyed if they can be used for another purpose.

Survey report.—The board of survey appointed will personally see the articles listed on the request for survey, except when listed as lost, and will see that the number of articles corresponds with the amounts shown on the request for survey. Articles will not be surveyed when only a piece is shown. For example: If only a small part of a sheet is shown, this will not be accepted as a sheet. It is necessary that the entire sheet or the major part of the sheet be presented to the survey board, and the same principle will hold true regarding other items.

The report will be typewritten whenever possible. The report will always state the number and date of the request.

The board will render, in accordance with the provisions of article 1907, United States Navy Regulations, a full and exhaustive report relative to the loss or deficiency and shall fix definitely, when possible, the responsibility therefor. Each item shall be separately reported upon and the invoice price shall be stated. The report of the board will be rendered in quadruplicate to the officer ordering the board, via the officer requesting the survey, who, upon approval thereof, shall forward the original and two copies to the Bureau of Medicine and Surgery, with notation by indorsement thereon as to whether or not any disciplinary action has been taken by him, and return one copy to the officer requesting the survey, who will forward the copy with the monthly or quarterly returns as a voucher for the expenditure of the articles.

In addition to stating the item number, name of item, invoice price, appraised price, and report, the following recommendations may be made as the case requires:

"To naval medical supply depot."

"To Supply Department, 'For sale,' or 'For yard scrap heap.'"

"To destroy, of no value."

"To loss."

"To naval medical supply depot." Articles will be recommended to be turned in to the nearest naval medical supply depot when they are "in excess" or unfit for use in present condition but capable of being repaired. Surgical instruments, platinum needles, X-ray tubes, etc., will always be turned in to the supply depot.

"For sale." When a board of survey recommends an article "For sale," they will be guided as follows: Articles of any nature not warranting repairs, except as noted under "To naval medical supply depot," and which can be sold in piece shall be condemned "For sale" with an appraised value. When report of survey includes recommendation "For sale," it shall be rendered in quintuplicate.

"For yard scrap heap." When a board of survey recommends an article to "Yard scrap heap," they will be guided as follows: Articles of metal un-serviceable and not warranting repairs and which can not be sold in piece to advantage, shall be condemned to the "Yard scrap heap."

"To destroy, of no value." This recommendation will only be made when the article can not be disposed of under any of the above dispositions.

"To loss." The action of the board when this recommendation is made is fully explained in article 1389, Navy Regulations.

Should the board of survey find that any of the items listed in the request for survey can be economically repaired on the station, or are fit for use without repairs, the survey board will eliminate these items from the report of survey by indicating on the request for survey by writing thereon, "Retain" or "Repair."

It will not be necessary to survey articles that are to be repaired on the ship or station. A requisition, or a request for job order, if repairs are to be made by a navy yard, will be submitted to the bureau for approval.

Approved survey.—When a report of survey is returned approved, the commanding officer will appoint an officer to personally supervise the destruction of property that is approved "To destroy, of no value." The officer so appointed will certify on the file copy that he has personally supervised the destruction of the number of articles shown in the approved survey. The articles will be actually destroyed except in the case of sheets, towels, and other linen, that may be torn up and used for cleaning material. By having the sheets and other linen torn up in small pieces and not surveying anything but entire sheets or linen, surveyed material can not be resurveyed or returned for use. Actually destroying surveyed articles should not result in any loss to the Government, as only absolutely worthless articles should be surveyed.

In case of articles recommended to be turned into the medical supply depot, Form D will be prepared and forwarded (in triplicate) to the medical supply depot, accompanied by a copy of the approved survey. One copy will be retained in the supply depot, the other two copies signed and returned, one copy to the hospital, ship, or station, and one copy to the bureau. The same will hold true of materials turned over to the supply department for sale.

When articles have been lost or are missing, a copy of the report of the board of survey will be forwarded with the "Report of receipts and expenditures" in the case of ships and stations, or with the monthly "Recapitulation" in the case of hospitals. This copy will act as a voucher for the expenditure of nonexpendable articles. Returns will show the actual condition of property values and when articles are lost or missing they will be expended from the books by survey and not shown as being transferred to next quarter.

Replacements.—Any article under the approved survey authorized to be destroyed, for sale, or otherwise disposed of, may be replaced by appropriate requisition, provided it appears in the allowance list of the Supply Table. The requisition submitted pursuant to such survey shall, in all cases, bear the reference number of the survey and date of its approval. Articles not on the allowance list of the Supply Table, will be replaced only by a special requisition stating the necessity therefor.

Bureau of Navigation Circular Letter No. 32-23.

N61-St : 57354-103.

NAVY DEPARTMENT,

BUREAU OF NAVIGATION,

Washington, D. C., May 12, 1923.

To: All ships and stations.

Subject: Advancement in rating.

Reference: (a) Bunav Circular Letter No. 12-22; (b) Bunav Manual, articles D-4100 to 4104 (Change, No. 2).

1. In reference (a) the bureau prescribed certain requirements necessary before men could be considered qualified for advancement in rating. Reference (b) superseded reference (a).

2. Before authorizing the advancement of a man to any petty officer rating, the bureau requires that he—

- (a) Be of good petty officer material;
- (b) Be recommended by his commanding officer;
- (c) Pass the required examination for advancement;
- (d) Serve one year in next lower rating with at least 3.5 in proficiency in rating, sobriety, and obedience; and
- (e) Be placed on the bureau's eligibility list in the rating for which qualified.

3. The bureau does not intend to relax in any particular the above requirements, but it does, however, desire to reduce the time elapsing between the date a man is fully qualified and the date of his advancement. To this end, the bureau authorizes commanding officers to examine and recommend men who are qualified in all respects, except in point of time, upon completion of nine months' satisfactory service. These men will be placed on the bureau's eligibility list as of date of completion of their year's service in the next lower rating. Should the bureau anticipate that the requirements of the service will exhaust the eligibility list by this date, it will issue authorization for advancement to be effective upon the completion of the year's service in the next lower rating.

4. Examining boards should be kept organized at all times, so that delays in forwarding reports may be reduced.

5. Should a petty officer, recommended to the bureau, fall below the required standards in marks or otherwise demonstrate his unfitness for advancement between the date of his recommendation and the bureau's authorization, the commanding officer shall so report, and the man's name will be removed from the eligibility list. Should the authorization for advancement have been received from the bureau, it shall be returned for cancellation.

6. Examination for lower ratings (other than petty officer) may be held in advance of completion of the year's service in time to advance men promptly upon that date, providing their records warrant.

7. In this connection, the attention of commanding officers is invited to the fact that they should give due consideration to the entries in the service records in column "Rating best qualified to fill."

THOMAS WASHINGTON.

Circular letter.
Serial No. 263-1923.

WWB EGM: P 21 42022.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 16, 1923.

To: All medical officers.

Subject: Examination of candidates for appointment to the warrant grade of pharmacist.

References: (a) Bunav. Circular Letter No. 31-23, N64-GWL, 6085-178, of 10 May, 1923; (b) articles D-5118, 5123 to 5130, inclusive, and 5700, Bureau of Navigation Manual.

1. In connection with the examination to be held the week beginning August 20, 1923, it is requested that all prospective candidates be informed of the need for additional officers of this grade and the bureau's desire that as many chief pharmacist's mates as possible submit requests for the examination. It is believed that if medical officers will properly present the advantages of appointment to this grade much desirable material may be persuaded to appear for the examination.

2. It is the intention of the bureau to have as members of the statutory examining board in Washington officers of the Medical and Hospital Corps who have general all-around professional attainments rather than officers who have specialized in certain subjects. The bureau further will direct that the questions prepared by the statutory board be broad in scope and such as will require a thorough, general, working familiarity rather than an intimate technical knowledge of such subjects as chemistry, pharmacy, materia medica, and toxicology, and will permit the candidates to demonstrate fully their knowledge of those administrative duties, especially with regard to accounting and property supervision, with which the majority of pharmacists and chief pharmacists to-day are concerned.

3. The ability and knowledge demonstrated in the practical and oral examinations before the supervisory board, the records of fitness and efficiency, and the recommendations forwarded in each case are to be accorded all possible consideration in determining a candidate's suitability for appointment.

E. R. STITT.

Circular letter.
Serial No. 264-1923.

WSD/JBC 124677-0(52).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., May 31, 1923.

To: All naval hospitals (continental limits); post surgeon, marine barracks, Quantico, Va.; senior medical officer, naval submarine base, San Pedro, Calif.; commanding officer U. S. S. *Relief*; commanding officer U. S. S. *Mercy*.

Subject: Information for next of kin of Marine Corps dead.

References: (a) Paragraph 2952, Manual for the Medical Department, 1922;

(b) paragraph 2965, Manual for the Medical Department, 1922.

Inclosure: N. M. C. 817 Q. M.

1. The appropriation for care of the dead of the Marine Corps provides for "funeral expenses of officers and enlisted men, and accepted applicants for enlistments, retired officer on active duty during the war, and retired enlisted men of the Marine Corps, including the transportation of bodies and their arms and wearing apparel from the place of demise to the homes of the deceased in the United States." Under a decision of the Comptroller of the Treasury, the Marine Corps is authorized to pay not only the expenses of transportation of the body to the home of the deceased but also funeral expenses after arrival.

2. N. M. S. Hospital Form No. 61, "Information for next of kin," now in use for all Navy and Marine Corps dead, states that after the remains have been delivered to the next of kin at place designated by them the Navy Department is unable to defray any of the expenses which may be incurred in connection with funeral, interment, etc., there being specific law prohibiting such payment. This statement still applies to Navy dead but under the decision of the comptroller is not applicable to Marine Corps dead.

3. In view of the above the Major General Commandant Marine Corps has requested that Marine Corps Form No. N. M. C. 817 Q. M. "Information for next of kin of Marine Corps dead," be substituted for the Navy form in all cases where the Navy forwards the remains of marines to their next of kin.

4. An initial supply of the Marine Corps form is inclosed with this letter. Additional copies may be obtained on letter request addressed to the Major General Commandant Marine Corps.

E. R. STITT.

Circular letter.
Serial No. 265-1923.

WSG 126963(34).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 8, 1923.

To: All naval hospitals (2 copies).

Subject: Naval Reserve Force; medical care and treatment.

References: (a) Department's third indorsement, No. 28550-1309: 4, April 25, 1923, to Navy recruiting station, Denver, Colo.; (b) department's fifth indorsement, No. 28550-1399: 5, April 25, 1923, to this bureau.

Inclosures: Copies of above-mentioned references.

1. The bureau is inclosing, in duplicate, copies of the above-mentioned opinions of the Judge Advocate General of the Navy; one copy will be passed around for the information of all members of the staff, including medical, dental, and warrant officers, nurses, and Hospital Corps men, and clerks engaged on office work; the other is for the permanent files of the hospital.

2. The approval of these opinions by the Secretary of the Navy gives them each the force of a decision.

E. R. STITT.

[Third indorsement.]

28550-1399:4J.

DEPARTMENT OF THE NAVY,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, April 25, 1923.

From: The Judge Advocate General.

To: The officer in charge, United States Navy recruiting station, Denver, Colo.

Via: The Bureau of Navigation and the Bureau of Medicine and Surgery.

Subject: Naval Reserve Force, medical care and treatment for officers and enlisted men of.

Reference: Your letter to Bureau of Navigation, March 22, 1923.

1. In reference information is requested on the following questions:

(a) A man of the Naval Reserve Force, class 1-B and class 2; also of the Fleet Naval Reserve, class 1-C and 1-D, receiving medical attention in a private hospital not under the jurisdiction of naval authorities. Would expenses incurred in this connection be defrayed by the Government?

(b) Is a man classified in (a) entitled to medical attention at a naval hospital as prescribed in article E-802, Bureau of Navigation Manual?

(c) In the case of an officer?

(d) In case of death of personnel classified in (a), is the allowance for transportation of remains to home or to the home of his relatives, also the burial expense, the same as prescribed for men of the regular Navy and on active duty?

(e) In the case of an officer?

(f) An officer on the retired list of the Navy is ordered to appear as a member of a Naval Retiring Board. Is this officer entitled to the full pay and allowances of his grade while on such duty, and is he entitled to Government transportation from his permanent residence to place where the Naval Retiring Board may convene? Is he considered to be in an active duty status during this period?

The foregoing questions are answered seriatim as follows:

(a) Members of the Naval Reserve Force, class 1-B and class 2, receiving medical care and treatment in a private hospital not under the jurisdiction of naval authorities are not entitled to have the expenses incurred in connec-

tion with said treatment defrayed by the Government except when in an active duty status. For example, if members of the Naval Reserve Force, class 1-B and class 2, while in active service for training or in active service in any capacity other than at drills, require medical care and treatment which can not be furnished in kind by the Navy, the law authorizes its procurement from outside sources, the Government being responsible for the expense thereof if properly authorized and incurred. (26 Comp. Dec. 408.) But members of the Naval Reserve Force, class 1-B and class 2, are not entitled to medical care and treatment in a private hospital not under the jurisdiction of the naval authorities at the expense of the Government when the occasion for said care and treatment has arisen while not in an active duty status. Members of the Fleet Naval Reserve, class 1-C and 1-D, not on active duty are not entitled to medical care and treatment in a private hospital not under the jurisdiction of the naval authorities at Government expense, but they are entitled to said care and treatment at Government expense when on active duty if properly authorized and incurred.

(b) Members of the Naval Reserve Force, class 1-B and class 2, on inactive duty are not entitled to medical attention at a naval hospital as prescribed in article E-802, Bureau of Navigation Manual, but members of the Fleet Naval Reserve, class 1-C and 1-D, on inactive duty are entitled to naval hospital treatment and to medical treatment whenever they reside in localities where medical officers of the Navy are on duty. Such treatment will be given under the same local rules as apply to the treatment of enlisted personnel of the Navy. (Bureau of Navigation Manual, art. E-802.)

(c) Officers in the Naval Reserve Force on active duty are entitled to the same medical care and treatment as officers of the regular Navy in a duty status. (Act of July 1, 1918, 40 Stat. 712.) Officers of the Naval Reserve Force on inactive duty are not entitled to medical care and treatment by medical officers of the Navy or in naval hospitals; but where officers of the Naval Reserve Force or other members of the Naval Reserve Force on active duty incur disabilities requiring medical care and treatment, said medical care and treatment is generally continued after their enrollment in the Naval Reserve Force has expired.

(d) Members of the Naval Reserve Force on active duty are entitled to the same treatment relative to transportation of remains to home or to the home of relatives and burial expense as prescribed for personnel of the regular Navy on active duty. If not in "active service" at the time of death they are not entitled either to transportation of remains or burial at Government expense. However, where a member of the Naval Reserve Force dies at a naval hospital while not on active duty and without kin or friends to take charge of the remains, he may be interred at Government expense in the local burial grounds used by the Navy for such purpose.

(e) In the case of the death of an officer of the Naval Reserve Force on active duty the allowances for transportation of remains to home or to the home of his relatives and the allowance for burial are the same as prescribed for officers of the regular Navy of like grade and rank who die while in an active duty status. In the case of the death of an officer of the Naval Reserve Force while not on active duty, no allowance is authorized for transportation of remains or for burial expense. Where his death occurs at a naval hospital and there are no kin or friends to take charge of his remains, he may be interred at Government expense in the local burial grounds used by the Navy for that purpose.

(f) An officer of the retired list of the Navy ordered with his consent to duty as a member of a Naval Retiring Board is entitled to receive the active pay

and allowances of his grade if not above that of lieutenant commander in the Navy, except where his retired pay exceeds the active duty pay and allowances for the grade of lieutenant commander for the same length of service, in which event he shall receive his retired pay while on such duty (act of August 29, 1916), and he is further entitled to transportation from his permanent residence at Government expense to the place where the retiring board is convened. Said officer is in an active duty status until he has been relieved from duty as a member of said Naval Retiring Board.

• J. L. LATIMER.

Approved 25 April, 1923.

EDWIN DENBY,

Secretary of the Navy.

[Fifth indorsement.]

28550-1399: 5 J.

DEPARTMENT OF THE NAVY,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, April 25, 1923.

From: The Judge Advocate General.

To: The Chief of the Bureau of Medicine and Surgery.

Subject: Naval reservists, medical treatment of.

1. Forwarded, all papers returned.

2. In attached papers a decision is requested as to whether medical and hospital expenses may be allowed members of the Naval Reserve Force while engaged on board naval reserve vessels in any capacity other than at drills; and if so, whether such expenses may be paid for the entire period they are under medical or hospital treatment, regardless of the expiration date of their period of duty.

3. Under the provisions of the act of July 1, 1918 (40 Stat. 712), members of the Naval Reserve Force when employed in active service, ashore or afloat, under the Navy Department, "shall receive the same pay and allowances as received by officers and enlisted men of the regular Navy * * *."

4. The Comptroller of the Treasury held (28 Comp. Dec. 408) that enlisted men of the Navy are entitled to be furnished with medical care and treatment by the Government and when such care and treatment can not be furnished in kind by the Navy, the law authorizes its procurement from outside sources, the Government being responsible for the expense thereof, if properly authorized and incurred while the men are in a duty status.

5. Consideration of the provisions of the act of July 1, 1918, above quoted, discloses that members of the Naval Reserve Force when employed in active service are in the same status as officers and enlisted men of the regular Navy. It follows, therefore, that members of the Naval Reserve Force, when employed in active service are entitled to be furnished with medical care and treatment by the Government, and when such care and treatment can not be furnished in kind by the Navy its procurement is authorized from outside sources as in the case of members of the regular Navy in a duty status.

6. The act of August 29, 1916 (39 Stat. 587), provides that members of the Naval Reserve Force, upon application, may be assigned to "active service" for the purpose of instruction and training and requires a minimum of three months of such active service for training during each enrollment. The provisions of the act of August 29, 1918, above referred to, was amended by the act of July 1, 1918 (40 Stat. 710), by reducing the minimum active service

for training required to two months during each term of enrollment and further provides that the "active service" thus required may be performed "in periods of not less than 15 days each."

7. The Comptroller of the Treasury held (27 Comp. Dec. 726) that the active service required for training as provided in the act of July 1, 1918, above referred to, entitles members of the Naval Reserve Force to receive the same allowances as officers and enlisted men of the regular Navy while in a duty status.

8. It is the opinion of this office, therefore, that members of the Naval Reserve Force on duty under competent orders on board naval reserve vessels in any capacity other than at drills are in the "active service," and that while performing said service they are entitled to be furnished with medical care and treatment by the Government and that when such care and treatment can not be furnished in kind by the Navy the law authorizes its procurement from outside sources, the Government being responsible for the expense thereof if properly authorized and incurred.

9. It is the further opinion of this office that when it becomes necessary to incur expenses for medical and hospital services for members of the Naval Reserve Force procured from sources outside the Government, where medical and hospital treatment can not be furnished in kind by the Navy, that the Government is responsible for the total expense of the medical treatment and hospital service thus rendered regardless of whether or not their period of service would have terminated except for the disability arising prior to the termination of said treatment.

J. L. LATIMER

Approved 25 April, 1923.

EDWIN DENBY,

Secretary of the Navy.

Circular letter.

Serial No. 266-1923.

WEE: SS 129733(61).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 9, 1923.

To: All naval hospitals.

Subject: Physical examination for purpose of reinstatement of Government insurance.

1. The following letter has been received from the Director of the United States Veterans' Bureau, under date of June 7, 1923:

"A number of cases have recently been reported to the Veterans' Bureau where former service men under treatment at Navy hospitals have been unable to secure a physical examination for purposes of reinstatement of Government insurance and for purposes of making claim for insurance disability benefits under Government insurance policies. The medical officers have given the reason that they had no authority under existing regulations to make such examinations.

"The request is therefore made, if not contrary to regulations, that medical officers of the United States Navy be authorized to make such examinations for ex-service men, without charge to the applicant, in cases where the applicant, either for reinstatement of insurance or for insurance disability benefits, is an actual inmate or patient in a Navy hospital."

2. It is directed that medical officers comply with the second paragraph of the director's letter and that a physical examination be given ex-service men who are actually inmates or patients in a naval hospital, for the purpose of reinstating Government insurance.

E. R. STITT.

WSG 125949.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., June 9, 1923.

To: All naval hospitals, and U. S. S. *Mercy* and U. S. S. *Relief*.

Subject: Ration notices; Forms S and T.

Reference: Circular Letter 125949(92)/113366, serial No. 244-1923, February 21, 1923.

1. By separate inclosure the bureau is forwarding one pad each of the new edition of Forms S and T, as per paragraph 7 of reference.

2. These new forms will be immediately placed in use, and older editions of the same will be scrapped.

3. Particular attention is invited to paragraphs 4, 5, and 6 of reference; to keep the records clear, these forms will *always* be used when an officer is admitted and discharged, and if quarters or subsistence, either or both, shall have been furnished, his pay account will be checked; where Ration Notice S shall have stated "and will not be either quartered or furnished subsistence," and it shall subsequently develop that quarters and subsistence, either or both, must be furnished by the hospital, the changed status of such officer will be taken care of by the proper entries on Form T.

F. L. PLEADWELL, Acting.

By Executive order rates of rental and subsistence allowance remain unchanged for fiscal year 1924.

Circular letter.
Serial No. 267-1923.

WSD/JBC 124942-O.

WASHINGTON, D. C., June 18, 1923.

To: All naval hospitals.

Naval Medical School, Washington, D. C.

Naval Dispensary, Navy Department, Washington, D. C.

Post surgeon, Marine Barracks, Quantico, Va.

Senior medical officer, naval training station, Hampton Roads, Va.

Subject: Saturday half holidays during summer months; leave.

References: (a) Alnavsta six, June 18, 1923.

(b) Art. 404(6), (7), Naval Instructions, 1913.

1. In connection with above reference, attention is invited to the decision of the Comptroller of the Treasury (23 Comp. Dec. 192) regarding computations of periods of leave in which the so-called summer half holidays occur. Under this decision—

"The so-called Saturday 'half holidays' occurring in the summer season in a period of leave granted to an employee of a navy yard, etc., under the act of August 26, 1916, should be charged as full days of leave, since they are, as a matter of fact, not 'half holidays,' but are constituted by Executive orders as full days of work, although being only four hours in length."

2. Under the same decision it was held that, "Sundays occurring within periods of leave granted to employees of navy yards, etc., under the act of

August 29, 1916, should, in the case of a per annum employee, be charged against such leave, but in the case of a per diem employee should not be so charged, unless said per diem employee is required to work on Sundays; and Sundays occurring at the beginning or ending of a leave period should not be so charged in the case of any employee, unless applied for and granted as days of leave."

3. Paragraph 1578(2), Navy Regulations, 1922, provides:

"Civil employees at naval hospitals paid on a per diem, per month, or per annum basis shall be granted annual leave with pay and leave without pay in the same manner as per diem employees at navy yards and stations. (See M. and S. circular letter, serial No. 43-1920, No. 124942-O(31), July 1, 1920.)

4. Although hospital employees are paid on a per monthly basis (equivalent to per annum), in accordance with instructions of the Secretary of the Navy and the provisions of the schedule of wages, their monthly pay is computed on a basis of 26 times the per diem pay of the equivalent yard rating, thus specifically eliminating pay for Sundays. Therefore, although, on account of their per monthly status, they may be required to work on Sundays in emergency and their daily pay is computed as one-thirtieth of their monthly pay, they can not be held to be "per annum" employees within the meaning of the comptroller's decision, and Sundays occurring within or at the beginning or end of periods of annual leave will not be charged.

F. L. PLEADWELL, *Acting*.

Circular letter.
Serial No. 268-1923.

WEE: SS 128014(63).

WASHINGTON, D. C., June 18, 1923.

To: All medical officers.

Subject: Circular letters dated from December 9, 1919, to September 1, 1922.
Obsolescence of.

1. Subjects covered by circular letters dated from December 9, 1919, to September 1, 1922, have been for the most part modified and included in the paragraphs of the Manual of the Medical Department, 1922, or have become obsolete or are dealt with anew in subsequent letters. Circular letters prior to No. 212, dated September 1, 1922, are therefore obsolete.

2. Therefore, hereafter, in correspondence and otherwise, reference should be made to the paragraph in the Manual dealing with the subject under consideration and not with the circular letter. Circular letters subsequent to September 1, 1922, may be quoted for reference purposes, although the subjects of several have already been incorporated in the manual.

3. It is therefore desired that all medical officers take cognizance of this policy and refresh their files and reference.

F. L. PLEADWELL, *Acting*

Circular letter.
Serial No. 269-1923.

WWB/d P-15-42022.

WASHINGTON, D. C., June 21, 1923.

To: Commanding officers, naval hospitals.

Senior medical officers, ships and stations.

Subject: Advancement in rating of Hospital Corps men.

References: (a) Bunav Manual, article D-4100 to 4104 (Change No. 2).

(b) Bunav circular letter No. 32-23 of May, 1923.

(c) Bunav confidential letter N-6-Lo., 4111-1413-1 of 13 June, 1923.

1. The attention of all medical officers is directed to contents of reference (c) showing the serious shortage of Hospital Corps men in the pharmacist's mates'

ratings and the exceedingly small number of Hospital Corps men of the forces afloat, who were recommended for advancement in rating during May, 1923. The number of recommendations from shore stations indicates that, both ashore and afloat, Hospital Corps men are not being examined as soon as they become eligible for advancement.

2. The attention of all medical officers is directed to the changes regarding examinations for advancement, contained in reference (b).

3. In order to promote contentment, improve morale, encourage reenlistments, and decrease the shortage in the pharmacist's mates' ratings, it is directed that *all* Hospital Corps men be given an opportunity to take the examination for advancement in rating as soon as they satisfy all the requirements contained in reference (a) as modified by reference (b).

F. L. PLEADWELL, *Acting*.

Circular letter.
Serial No. 270-1923.

WWB/d F-2-42022.

WASHINGTON, D. C., 22 June, 1923.

To: All medical officers.

Subject: Form N. M. S. H. C. 2: Resumption of use of.

References: (a) Bu. M. and S. letter P-16-42022, PFD-MDC, of 10 October, 1919, par. 8.

(b) Manual of the Medical Department, 1922, par. 402, as changed by M. and S. letter 128014(41) of 12 April, 1923.

1. Reference (a) is canceled by reference (b).
2. A request for a supply of Form N. M. S. H. C. 2 will be submitted at once to the naval medical supply depot.
3. One copy of this form will be prepared immediately upon receipt of this letter for all members of the Hospital Corps except those undergoing instruction in the pharmacist's mates' school and the Hospital Corps training school, Mare Island, Calif., and forwarded to the Bureau of Medicine and Surgery direct.
4. This initial report shall be prepared with care so that all information requested will be furnished the bureau, and all later reports shall be as complete as possible.

F. L. PLEADWELL, *Acting*.

Circular letter.
Serial No. 271-1923.

WWB/d F-1-42022.

WASHINGTON, D. C., 22 June, 1923.

To: All medical officers, chief pharmacists, and pharmacists.

Subject: Forms N. M. S. H. C. 1 and 5 revised.

Reference: Par. 355(1) (j) Manual of the Medical Department, as changed by M. and S. letter 128014(41) of 12 April, 1923.

1. Forms N. M. S. H. C. 1 and 5 have been revised and the new forms will be placed in use immediately upon receipt of same.
2. A request for a supply of the revised forms will be submitted at once to the naval medical supply depot, and when received, use of the old forms will be discontinued.

F. L. PLEADWELL, *Acting*.

Circular letter.
Serial No. 272-1923.

WSD/MG 124677-O.

WASHINGTON, D. C., 22 June, 1923.

To: All naval hospitals.

Post surgeon marine barracks, Quantico, Va.

Naval submarine base, San Pedro, Calif.

Subject: Care of the dead; cremation.

Reference: M. and S. circular letter, serial No. 248-1923, No. 124677-O, March 3, 1923.

1. The annual contracts for care of the dead for the fiscal year 1924, prepared in accordance with reference, provide for the embalming, preparation, encasement, and transportation or burial of the dead of the Navy and Marine Corps. No provision is made in these contracts for cremation.

2. The bureau for a number of years has favored cremation as a means of disposition of the dead, but has been unable to adopt it as a general practice on account of opposition from the people from whom the enlisted force is largely drawn, and on account of certain religious objections to cremation.

3. When requested by the next of kin, however, and on prior authority of the bureau, cremation will be permitted at Government expense, provided such expense is not in excess of the amount which would be required to prepare and encase the body in the usual manner under existing contract, plus such additional amount as would be incurred by the Navy for interment or transportation home. In other words, the bureau is willing to meet the desires of the next of kin for cremation, provided the expenses are not in excess of those which otherwise would have been incurred.

4. The expenses of cremation, when authorized as above, will be covered by separate special requisition in each case.

F. L. PLEADWELL, *Acting.*

Circular letter.
Serial No. 273-1923.

WSD/MG 124942-O.

WASHINGTON, D. C., June 27, 1923.

To: All naval hospitals, continental limits and Pearl Harbor.

Naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.

Naval Medical School, Washington, D. C.

Post surgeon, marine barracks, Quantico, Va.

Senior medical officer, naval training station, Hampton Roads, Va.

Subject: Revised schedule of wages for civil employees under the Naval Establishment.

Reference: M. and S. circular letter, serial No. 255-1923, No. 124942-O, April 24, 1923.

1. The bureau is informed that the revision of the present schedule of wages will be released on June 30, 1923, and that the new rates of pay will become effective as of July 1, 1923.

2. The nature and extent of the changes carried in the new schedule are not yet known, but whatever the increases may be over present rates no additional funds can be allowed over the total estimated cost under present allotments for civil establishment, 1924. This measure is absolutely required because of the reduced appropriation for the fiscal year 1924 and the large increases in pay already in effect.

3. Immediately upon receipt of the new schedule, therefore, the activities addressed by this letter will make such readjustments in the civilian complement as may be required to keep within the *total* of the amount already allotted for 1924, and will submit report thereon showing revised distribution under the several subheads, as follows:

EXAMPLE.

Estimated cost, \$-----

Quarterly allotment, \$-----

		Pay per month.	Total.
(a) Transportaton:			
3 chauffeurs	-----	\$106. 08	\$3, 818. 88
1 machinist	-----	153. 08	1, 847. 04
			<u>5, 665. 92</u>
(b) Power house:			
1 engineman	-----	160. 16	1, 921. 92
4 firemen	-----	122. 72	5, 890. 56
			<u>7, 812. 48</u>
(c) Commissary:			
1 chief cook	-----	110. 00	1, 320. 00
Etc	-----		
			<u>-----</u>
(d) Laundry:			
1 chief launderer	-----	130. 00	1, 560. 00
Etc	-----		
			<u>-----</u>
(e) Bulldings and grounds:			
1 chief mechanic	-----	228. 80	2, 745. 00
Etc	-----		
			<u>-----</u>
(g) Technical:			
Etc	-----		

4. It will be clearly understood that the readjustment above directed contemplates the discharge of a sufficient number of employees to keep within allotments. In this connection attention is invited to the fact that no discretion is allowed in paying the rates of the schedule, and that employees of Groups I, II, and III who have been receiving the maximum pay of the schedule of May 1, 1923, must be paid the maximum of the schedule to become effective July 1, 1923.

F. L. PLEADWELL, *Acting.*

Circular letter.

WEE: SS 126039(54).

Serial No. 274-1923.

WASHINGTON, D. C., June 28, 1923.

To: All naval hospitals.

Subject: Examination of Red Cross personnel assigned to naval hospitals caring for tuberculous patients.

1. The following communication has been received from the Assistant Director of War Service, National Headquarters, American Red Cross, and from the Bureau of Naval Affairs, American Red Cross:

"I have been requested to advise you that the American Red Cross will be glad to have instructions issued to commanding officers of naval hospitals caring for tuberculous patients to the effect that Red Cross personnel assigned to these hospitals should be given a physical examination by medical officers at the time of their entrance on duty to the naval hospital concerned, and at such periods as may seem advisable."

2. The bureau desires that the request of the American Red Cross be complied with in so far as it is possible to do so.

F. L. PLEADWELL, *Acting.*

Circular letter.

WSD/MG 124942-O.

Serial No. 275-1923.

WASHINGTON, D. C., June 30, 1923.

To: All naval hospitals, continental limits and Pearl Harbor:

Naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.;

Naval Medical School, Washington, D. C.;

Post surgeon, marine barracks, Quantico, Va.;

Senior medical officer, naval training station, Hampton Roads, Va.

Subject: Revised schedule of wages for civil employees under the Naval Establishment, effective July 1, 1923.

Reference: M. and S. circular letter, serial No. 273-1923, No. 124942-O, June 27, 1923.

1. The schedule of wages which becomes effective July 1, 1923, contains certain changes which were not anticipated, and which necessitate amplification of the instructions contained in reference.

2. In making the readjustment directed by paragraph 3 of reference, the present 1924 allotments for civil establishment, both for "administration-clerical" and "maintenance and operation—labor," will be considered together as one sum, and the redistribution by subheads will include (f) clerical, as well as (a) transportation; (b) power house; (c) commissary; (d) laundry; (e) buildings and grounds; and (g) technical. For example, if present allotments are for maintenance and operation, \$100,000; administration, \$25,000; the total amount to be redistributed under the several subheads will be \$125,000.

3. The only exception to this readjustment of civilian force to keep within allotments will be in the case of the "reconstruction aid group," for which new request for allotment may be submitted based upon present number of employees; this item does not affect the bureau's appropriation.

4. It is suggested that most careful consideration be given to the practicability of discharging or furloughing certain parts of the force according to seasons; to accomplish this, the present plan of uniform quarterly allotments may be abandoned, and each quarter estimated to meet its needs, the total of the four quarters being held to the total of the present allotment. However, a definite amount must be estimated for each quarter, as:

First quarter.....	\$30,000
Second quarter.....	35,000
Third quarter.....	35,000
Fourth quarter.....	25,000
	<hr/>
	125,000

5. Consideration also will be given to the complete closing down of hospital laundry plants, discharging all employees, the saving from the pay of laundry employees to be distributed among the other hospital activities. The hospital laundry would then be sent, if practicable, to some other Government laundry

in the vicinity, or, if such arrangement can not be made, handled by contract. The bureau will consider such action, if recommended.

6. It is noted that the schedule makes no change in the method of computing the pay of chief mechanics, head mechanics, etc. Any difficulties arising in connection with the pay of these supervisory mechanical employees will be submitted to the bureau by separate letter.

F. L. PLEADWELL, *Acting*.

Circular letter.
Serial No. 276-1923.

WEE:SS 128586(73).

WASHINGTON, D. C., *July 17, 1923.*

To: All medical officers.
Subject: Pension legislation.

1. Attention is invited to the following act of Congress, approved September 22, 1922:

[Public—No. 361—67th Cong. (H. R. 10196).]

AN ACT To provide for the applicability of the pension laws to certain classes of persons in the military and naval services not entitled to the benefits of Article III of the war risk insurance act, as amended.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 312 of the war risk insurance act, as amended by section 17 of the act of June 25, 1918 (Fortieth Statutes, page 613), shall not be construed as making the pension laws inapplicable to persons admitted into the military or naval service after six months from the passage of the act of August 9, 1921, establishing the Veterans' Bureau and adding section 315 to the war risk insurance act.

Approved, September 22, 1922.

2. It will therefore be noted that all men who are not entitled to medical treatment and compensation from the Veterans' Bureau because of enlistment since February 9, 1922, or for other reasons, are entitled to pension, provided the case is favorably viewed by the Pension Bureau. It is, therefore, no longer necessary to retain under treatment cases of physical disability who are in a pensionable status for a longer time than is necessary to provide suitable relief from the present condition.

E. R. STITT.

Circular letter.
Serial No. 277-1923.

WSD/MG 124942-0.

WASHINGTON, D. C., *July 18, 1923.*

To: All naval hospitals, continental limits and Pearl Harbor,
Naval Medical School, Washington, D. C.,
Post surgeon, marine barracks, Quantico, Va.,
Senior medical officer, naval training station, Hampton Roads, Va.,
Naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.

Subject: Civilian employees; military preference.

References: (a) M. & S. circular letter, serial No. 275-1923, No. 124942-0, June 30, 1923.

Inclosures: (A) Navy Department circular letter No. SONYD-7-VR, March 23, 1923.

(B) Navy Department circular letter No. SONYD-7-VR, April 25, 1923.

1. In connection with the reduction of civilian personnel required by reference (a), attention is called to the Executive order of March 3, 1923, regarding

preference to be given ex-service employees, as set forth in inclosures (A) and (B).

2. The paragraph of the Executive order particularly applicable at this time reads:

"In the event of reductions being made in any part of the classified service, no person entitled to preference in original appointment shall be discharged or dropped or reduced in rank or salary if his record is good."

3. In effecting reductions in force, especial care will be taken to comply with the above provision.

E. R. STITT.

Circular letter.

SONYD-7-VR.

WASHINGTON, April 25, 1923.

From: Assistant Secretary of the Navy.

To: Chiefs of bureaus, boards and offices.

Commandants, all naval districts.

Commandant, navy yard, Washington, D. C.

Commanding officer, naval air station, Anacostia, D. C.

Inspector of Ordnance in charge:

Naval Proving Ground, Indianhead, Md.

Naval torpedo station, Alexandria, Va.

Naval ordnance plant, South Charleston, W. Va.

Commanding officer, Naval Hospital, Washington, D. C.

Superintendent, Naval Academy, Annapolis, Md.

Major General Commandant, Headquarters, U. S. M. C.

Subject: Military preference—Executive order of March 3, 1923.

Reference: Department's circular letter of March 23, 1923.

1. As a result of the promulgation of the Executive order of March 3, 1923, by reference, a number of questions have been submitted to the department with respect to the effect of the Executive order. For the information and guidance of all concerned, there are given below the questions with appropriate answers:

1. Question. If necessary to reduce force composed entirely of employees in like ratings, all of whom are entitled to military preference, on what basis should discharge be made?

Answer. On basis of relative efficiency in like ratings.

2. Question. Does Executive order apply to Groups II, III, IVa, IVb, and IVc (classified) and except Group I (unclassified)?

Answer. Department, by paragraph 2 of reference, specifically applied the provisions of the Executive order to all employees regardless of their classification, and therefore included Group I (unclassified).

3. Question. Can employees entitled to military preference in appointment be reduced in pay in the event of a new pay schedule becoming effective providing a lower rate of pay in certain or all ratings?

Answer. Yes.

4. Question. What is effective date of Executive order?

Answer. An Executive order is analogous to law in that it becomes effective the date it is signed by the President, unless otherwise indicated. Therefore, the order of March 3, 1923, is effective on and after date of its issuance, viz, March 3, 1923.

5. Question. Assumed that employees in Group I (unclassified) are excepted from the provisions of the Executive order of March 3, 1923, unless at sometime they have had a classified status.

Answer. Department has provided that Executive order shall apply to Group I employees as well as all others. (See 2.)

6. Question. Could a discharge or furlough be made among employees in a like rating all of whom are entitled to military preference in the event of lack of work or funds?

Answer. They could be furloughed not to exceed the number of days provided in article 321, Naval Instructions, 1913, or discharged. In this connection, no law or Executive order presupposes the retention in employment of any employees regardless of whether they have military preference or not, when there is no work for them in their rating, or when there are no funds out of which their services may be paid. In the latter instance, lack of funds in a particular appropriation is immaterial; as they may be shifted from one appropriation to another, which is mere paper work detail.

7. Question. Can a supervisory or other employee whose retention in his rating is based on a requirement that he have a specific number of employees under his supervision, be reduced in rating when the force he supervises is reduced to the point where his rating can no longer be maintained?

Answer. Yes. (See 6.)

8. Question. If work, funds, and allowed complements are all sufficient there may still exist an excess of those with military preference in one branch or trade. How is balance of force to be obtained? For example, the force of planners may require reduction to 12; the normal balance of force as reduced might require 2 machinist planners; yet there may be 3 in the force before reduction. How would the one in excess be handled?

Answer. Assuming that all employees in the rating in excess are veterans, reduction will be confined to employees in this particular rating on basis of relative efficiency. Under existing regulations, excess employees will be returned to the shop.

9. Question. What action should be taken in the case of employees entitled to military preference who become physically unable to perform any work?

Answer. To be separated.

10. Question. What action should be taken in the case of an employee entitled to military preference who becomes physically unfit to perform the work of his rating, but is physically able to perform less arduous duties in some lower paid rating. Is reduction thereto prohibited?

Answer. No.

11. Question. In case of an employee who was not entitled to military preference when first appointed, subsequently through military service gains such status, is he entitled to preference as provided in the order, as is given to those originally appointed with military preference?

Answer. Yes.

12. Question. Is it not the intention of the order to forbid discharge or reduction of preference employees when funds or work do not warrant their retention?

Answer. No.

13. Question. Paragraph 67, Form 2009, defines "good" as equivalent to a percentage rating of 70 to 80. The term is used for yard system of efficiency rating. Is it intended that under the terms of order that the word "good" shall be strictly interpreted in this sense?

Answer. Yes.

2. Commandants of naval districts will transmit this letter to all organizations coming within their jurisdiction.

3. Chiefs of bureaus and offices will transmit this letter to all inspection offices under their jurisdiction.

4. The Major General Commandant United States Marine Corps will transmit this letter to all organizations of the United States Marine Corps not under the command of naval officers.

(Signed)

THEODORE ROOSEVELT.

THE DIVISION OF PREVENTIVE MEDICINE.

Lieut. Commander J. R. PHELPS, Medical Corps, United States Navy, in charge.

Notes on Preventive Medicine for Medical Officers, United States Navy.

REPORT OF WORK CARRIED ON DURING 1922 BY THE BUREAU OF LABORATORIES, DEPARTMENT OF HEALTH, NEW YORK CITY, UNDER THE DIRECTION OF DR. WILLIAM H. PARK.¹

The valuable work with diphtheria accomplished by the Health Department of New York City is well known in the public health world. The official report of the continuation of that work during 1922 is interesting as well as the report of progress in laboratory investigations of whooping cough and likewise the results of miscellaneous activities of the bureau during the year, quoted below:

DIPHTHERIA PREVENTION WORK.

Work in the schools.—We have continued the work in the public schools during the spring and fall terms of 1922 and have finished in nearly all. In the fall we also started to carry out the Schick test actively in the parochial schools and expect to finish these schools during the coming spring term.

Each child in the Boroughs of Manhattan and Bronx received not only the Schick test, but also the control test. In the other boroughs the Schick test alone was used. We hope to come to a final decision as to whether there is a sufficient number of pseudoreactors among school children to justify the control test. It is invariably used for obtaining scientific data or in retests when we wish to make final decision as to the presence or absence of immunity.

We have made repeated efforts to have the technique of the test and the interpretation of the reaction witnessed by practicing physicians in this city, so that they in turn can apply the test to the children in their private practice.

During the spring of 1922 we used mixtures of toxin-antitoxin containing from 3 to 6 L plus doses of toxin to each cubic centimeter. During the fall mixtures of toxin-antitoxin were used containing one-tenth L plus per cubic centimeter.

¹ From the Monthly Bulletin of the Department of Health, city of New York, May, 1923.

Many of the children in the public schools tested and injected in the spring were retested in the fall. The different mixtures used gave different immunity results. In a general way the immunity response seemed not to depend upon the L plus content in each dose but upon the unneutralized or partly neutralized portion of toxin in the toxin-antitoxin mixture. The results of the injection into guinea pigs of the two mixtures confirmed the results obtained in children.

The new mixtures of toxin-antitoxin containing one-tenth L plus toxin per cubic centimeter gave much less local and constitutional disturbance than the previous mixture with the larger protein content. The efficiency of these mixtures will be determined further during the coming months in additional schools and institutions in which they were used.

New public and parochial schools tested and children injected during 1922.

Boroughs of Manhattan and the Bronx:

Number of schools tested..... 113

Children tested in the schools..... 88,288

Boroughs of Brooklyn, Queens, and Richmond:

Number of schools tested..... 173

Children tested in the schools..... 61,137

Children and adults tested in institutions..... 10,222

In the city we retested the pupils of 111 public schools. At the same time that we retested the children that had been previously injected with toxin-antitoxin we also Schick tested for the first time the newly admitted children to the kindergarten and 1-A classes. From 60 to 80 per cent of the children in these classes showed positive reactions.

We gave two additional injections of toxin-antitoxin to the children who had been previously injected with toxin-antitoxin and who still showed the positive Schick reaction at the retest. For this purpose we obtained additional consent from the parents.

Preschool work.—Work among children at preschool age was a logical sequence to the Schick work in the schools, through which nearly 800,000 homes had already been reached with the literature on diphtheria prevention.

The preliminary circularization of the homes consisted of distributing through the public schools, just before they closed in June, 200,000 copies of a special circular printed in English, Italian, and Jewish. Another important and effective method of reaching many parents was through 50,000 special mailing cards sent to all parents whose babies had been registered at the stations during the years 1920 and 1921.

The preschool diphtheria work was started on July 1 and continued until September 15. The injections were given in the ma-

jority of the baby health stations of the department of health, of the Diet Kitchen Association, and of the American Red Cross; also in a majority of the mothers' and babies' vacation playgrounds in the public schools. Each child received not only the Schick test but was also given three injections of toxin-antitoxin. A temporary diphtheria vaccination certificate was issued to each child. Nearly 8,000 children were injected. The work with preschool children has inherent difficulties in that the individual family has to be reached. This is in striking contrast to the work in the schools, where thousands of children, and through the children the parents, can be reached in a short time.

A circular letter was sent to 6,000 physicians urging them to cooperate with the department of health in distributing literature and giving the injections of toxin-antitoxin to the young children in their private practices. Each physician also received a list of the stations in which the Schick outfits and supplies of toxin-antitoxin are obtainable free of charge in New York City. Sample copies of the special circular in different languages were also inclosed. Two hundred physicians sent in requests for literature.

In institutions.—The Schick work and toxin-antitoxin immunization was started in 10 new institutions.

Preparations of toxin-antitoxin.—Toxin-antitoxin mixtures act most effectively when slightly underneutralized. If too much underneutralized, the injections produce a local inflammatory reaction.

About the best preparation is a mixture which in 1 cubic centimeter (the human dose) produces paralysis in guinea pigs with considerable proportion of deaths. This mixture produces a good immunization and but little local reaction. A mixture a little more toxic is safe and somewhat more effective but produces more local reaction. A mixture more neutralized is less effective. Toxin (without mixture of antitoxin) in safe doses produces less antitoxin response than suitable toxin-antitoxin mixtures.

The antitoxin response to three injections of different mixtures of either one-fifth cubic centimeter or one-tenth cubic centimeter is shown in several hundred guinea pigs.

The relation between the toxicity of toxin-antitoxin and the immunity response in guinea pigs; also between toxin-antitoxin and unmodified toxin.

The results obtained from three injections of toxin-antitoxin solution in several groups of guinea pigs.

The antitoxic response was tested by means of the Schick test:

Toxicity of the four preparations.

Most toxic.	Less toxic.	Still less toxic.	Least toxic.
1 c. c. causes death in 12 to 18 days; 5 c. c., death in 3 days.	1 c. c. causes death in 20 to 22 days; 5 c. c., death in 5 to 10 days.	1 c. c. causes paralysis; 5 c. c., death in 15 to 18 days.	1 c. c. causes no paralysis; 3 c. c., paralysis; 5 c. c., usually death after 30 days.

RESULTS OF SCHICK TEST 11 WEEKS LATER.

59 negative, 2 positive, 96 per cent immune.	67 negative, 11 positive, 86 per cent immune.	25 negative, 9 positive, 73 per cent immune.	36 negative, 44 positive, 45 per cent immune.
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Immunity results following three infections of unmodified toxin (dose 0.066 or 0.1 or 0.2 M. L. D.).—One hundred and nineteen guinea pigs were tested 11 weeks after treatment; all gave the positive Schick reaction, proving that there had been no immunity response.

Diphtheria toxin production.—Eight comparative tests of the Research No. 8 and Pasteur cultures of *B. diphtheriae* cultivated upon different peptone broths were made at different periods throughout the year 1922. The results may be summarized as follows:

(a) The Pasteur culture cultivated on Parke-Davis peptone broth is still capable of producing a potent toxin.

(b) The Pasteur culture which has been kept exclusively on Löffler serum produced the most potent toxin of any of the cultures tested, except in one test when it was equaled by the toxin produced by Pasteur culture kept in Parke-Davis broth.

(c) The Pasteur culture which had been subcultured from Parke-Davis peptone broth to Witte peptone broth has lost to a slight degree its toxigenic property; that is, it now produces toxin 1 to 800 instead of 1 to 1,000.

(d) The Pasteur culture subcultured from Witte peptone broth to Parke-Davis peptone broth has not as yet recovered its toxigenic property.

(e) The Research No. 8 cultures which had been cultivated exclusively in Witte peptone broth since 1895 have not as yet recovered their toxigenic property.

PERTUSSIS WORK.

Improved methods for the isolation and cultivation of B. pertussis.—The need of more strains of *B. pertussis* for inquiry as to the presence of types and the possibility of making a more effective vaccine was the starting point of this work.

Although it is comparatively easy for an experienced worker under favorable conditions to isolate *B. pertussis* in the first 10 days of the disease, it becomes more difficult to do so as the disease advances. The greatest obstacle is the accompanying growth of *B. influenzae*. The latter appear in increasing numbers as the disease progresses, and because they grow much faster, they outgrow *B. pertussis*.

In the search for a more favorable medium for the isolation of *B. pertussis*, the chief object was to find a substance which would inhibit in a measure the development of *B. influenzae* and at the same time be favorable for the growth of *B. pertussis*.

It was found that a definitely acid reaction (Ph 5) in a Bordet-Gengou medium is favorable for the isolation and growth of *B. pertussis*, and at the same time such a reaction inhibits the growth of *B. influenzae* and a number of other organisms.

The superiority of an acid Bordet-Gengou medium over a "neutral" (Ph 7.2 to 7.4) one used heretofore, was demonstrated in the second series of whooping-cough cases in which 43.5 per cent of isolation were obtained as compared with 22.8 per cent isolations in the first series of analogous cases in which a "neutral" Bordet-Gengou medium (Ph 7.2 to 7.4) was used.

It was also found that *B. pertussis* grows very profusely immediately after isolation on a glycerin veal potato agar of an acid reaction (Ph 5.8 to 6.1) to which blood in the proportion of 1 to 4 is added. This fact is important when large quantities of freshly isolated cultures of *B. pertussis* are desired for antigens or vaccines; at present chocolate veal agar is used for this purpose, but *B. pertussis* grows on this medium only after many weeks of continuous cultivation.

To determine the length of time B. pertussis is harbored by the patient.—Repeated cultures were taken from pertussis patients; but in no case was the organism isolated after the fourth week of the whoop. This work is still in progress.

Attempts to isolate B. Pertussis from diseases other than whooping cough.—Cultures from fresh "colds," measles, scarlet fever, croup, and diphtheria have thus far proved negative for *B. Pertussis*. This work is also still in progress.

Potency of stored pertussis vaccine.—The problem was to determine whether stored vaccines retained their potency for any length of time, or deteriorate soon after preparation, as claimed recently by some clinicians and laboratory workers. Vaccines were prepared in 1921 and kept in the ice box. Tests were made after storing 1, 2, 3, 4, 6, 12, and 18 months. Rabbits were immunized with each preparation and their sera were tested for agglutinin and complement-fixing antibodies.

It was found that although there was considerable fluctuation in the response of different lots of rabbits, the amount of deterioration as measured by the stimulation of specific antibodies, was small even after 18 months' storage. If the therapeutic value of pertussis vaccines can be measured by their specific antigenic value, these results indicate that properly stored vaccines will remain potent for at least 12 months and probably for a much longer period.

Classification of pertussis strains.—We reported last year that in studying some strains of pertussis bacilli we found immunological differences among them. We continued this study on many more strains, both recently isolated and those that had been under cultivation for many years, and we found that they can be classified into two distinct types by means of agglutination and agglutinin-absorption tests. Among the old strains we found both A and B in about equal numbers; but in our recent isolations the predominating type is B. The significance of these findings is still under investigation. It may have an important bearing on the value of the vaccine; that is, the success or failure of the vaccine may depend on whether it will immunize against one or both types of the pertussis bacilli.

Results of vaccine prophylaxis against pertussis.—Between November 20 and June, 1921, 24 institutions, with an average total census of about 10,000 children between 3 and 16 years of age, were kept under observation. The children who were 10 years old and under were given the vaccines as follows: 2,374 children were injected with pertussis vaccine; 1,971 were inoculated with pneumococcus or influenza vaccine and used as vaccinated control cases. During 1921 and 1922, 692 of these children under study left these institutions and 660 under 10 years old were admitted.

In 15 of these institutions no whooping cough developed, although in one of the 15 institutions, about six weeks after the vaccinations were done, a child with whooping cough was admitted and was kept for only one day in isolation. No other cases followed. In 10 institutions, with a total census of 5,359, whooping cough developed within 4 to 20 months after the vaccinations. In one institution there were 9 cases 1 year after the injections; in a second institution there were 16 cases 19 months after; in a fifth, 25 cases about 8 months after; in a sixth, 2 cases 10 months after; in a seventh, 20 cases 6 months after; in an eighth, 15 cases 4 months after; in the ninth, 7 cases 5 months after; in the tenth, 1 case 10 months after. In all there were 123 cases of pertussis, as follows: Twenty-nine cases of whooping cough among children injected with Bordet-Gengou bacilli type A, or 1.7 per cent of the children inoculated with this type of vaccine; 4 cases of pertussis among children injected with Bordet-Gengou bacilli, mixed type A and type B (1.3 per cent of those in-

jected with this vaccine); 17 cases of pertussis among the control children vaccinated with pneumococcus and influenza vaccine (1.3 per cent of those so vaccinated); 73 cases among the nonvaccinated, new admissions (2 per cent among the nonvaccinated controls).

The dosage was usually 10 billion given in three injections—that is, 2 billion, 4 billion, 4 billion, five days apart. The vaccines were of varying ages, some were freshly prepared, some were several months old. Apparently the age of vaccine used had no influence in determining the amount of immunity. With the exception of about 550 children who received type B vaccine, either pure or mixed with type A, the pertussis vaccine employed consisted of type A Bordet-Gengou bacilli (six mixed strains). In November, 1922, we began a new series of injections in the institutions with type B Bordet-Gengou bacilli to try whether this strain, which seems to be found more constantly in the sputa of whooping-cough cases, is more efficient in its protecting power.

MISCELLANEOUS ACTIVITIES.

The etiology of epidemic influenza.—The naso-pharyngeal washings and their filtrates from a series of cases diagnosed clinically as influenza were studied to find out, first, the pathologic effect on rabbits when inoculated intratracheally (Olitsky and Gates reaction), and second, the cultural content especially as to the presence of *B. pneumosintes*, and the effect on rabbits of these cultures. We were not able to corroborate the findings of Olitsky and Gates.

Value of pneumococcus vaccine in pneumonia prophylaxis.—To test out the efficiency of mixed pneumococcus vaccine (types 1, 2 and 3) as a preventive agent for pneumonia, the inoculation of the patients at the Manhattan State Hospital was begun in November, 1921. This study has been continued during 1922. During the past year, a daily average of 1,500 men patients and 1,900 women patients inoculated with pneumococcus vaccine, and an equal number of uninoculated patients as controls, as similar in age and general condition as it is possible to choose, have been under constant observation.

Since we believe that the immunity conferred by pneumococcus vaccine does not last longer than from four to six months, the men were reinoculated in the spring and again in the fall. The women, however, were reinoculated in the fall only.

During 1922, there were reported in the entire hospital 31 cases of broncho-pneumonia and 8 lobar pneumonia among men. Of these, 5 broncho-pneumonias were among the inoculated men and 6 among the uninoculated controls. Two lobar pneumonias were re-

ported in the inoculated group of men and two in the uninoculated group.

In the same interval, among the women patients there was a total of 11 broncho-pneumonias and 14 lobar pneumonias. Two inoculated women had broncho-pneumonia as against 6 uninoculated controls. One inoculated woman had lobar pneumonia as against 6 controls.

Influenzal meningitis.—A number of new influenzal meningitis strains were sent from the division of meningitis for the determination of type. Two more strains were added to the predominant group. A series of rabbits are being immunized now to have serums of at least three types on hand.

Antipoliomyelitis serum.—This investigation was made to determine the prophylactic and therapeutic value of the "antipoliomyelitis serum" produced by the inoculation of a horse with increasing doses of active poliomyelitis virus. It was found that the serum of the horse reached a stage where it delayed the death of a monkey after a fatal dose of the virus, even when the serum was given 48 hours after the virus injection or even at the onset of symptoms. However, this horse serum on later bleedings was poisonous for the monkey, due, apparently, to the fact that the horse was receiving too large doses of the poliomyelitis virus.

Measles.—Confirmation of our previous work on experimental measles in rabbits and monkeys was carried out. In the first series of animals the virus of measles obtained from patients with measles on the second day of the disease was passed through 4 rabbits and then produced symptoms typical of measles in a monkey.

In the second series of animals the virus obtained as stated was passed through 3 rabbits and then through 3 monkeys in which symptoms typical of measles were produced. The monkey-to-monkey passage eliminated any question of rash due to foreign protein.

A control monkey injected with normal human blood showed no reaction.

The results of these two series of passages confirm our previous findings that the virus of measles survives rabbit passage and produces symptoms typical of measles in the monkey (*M. rhesus*).

The relationship of hemolytic streptococci to scarlet fever.—From the naso-pharynx of 55 cases of scarlet fever, strains of hemolytic streptococci have been isolated early in the disease. The relationships of these strains have been studied by means of the agglutinin absorption test and by the serum protection test. The work is still incomplete, and definite conclusions can not be drawn until it is finished. Thus far there seems to be a dominant serologic group among these strains.

Agglutinin absorption.—The investigation on this procedure has been practically completed. The results have shown very definitely the value and the limitations as well as the best methods of carrying out this procedure when applied to the serological identification or classification of bacteria; also in its use as an index as to whether or not a prevailing bacterial variety has etiological significance.

Classification of the paratyphoid-enteritidis group.—This has led to the recognition of pathogenic varieties of this group occurring in enteric infections which otherwise would not have been recognized.

This work has also been of help in studying the source of food infection. One small outbreak of food infection was traced to tapioca pudding contaminated with the hog cholera bacillus which came from pork products through handling. The pork products themselves were shown to have been sterilized by the subsequent cooking.

MILK.

Pasteurization of milk.—The object of these tests was to determine the efficacy of commercial pasteurization, also to determine the optimum temperature and time in order to set a standard for commercial pasteurization.

Preliminary tests were made on small volumes of milk infected with typhoid bacilli and pasteurized at temperatures ranging between 130° to 145° F. The thermal death point of typhoid bacilli in milk was found to vary inversely to the temperature employed; at 130° F. some organisms survived even one hour pasteurization; at 142° to 145° F. all were destroyed in four to eight minutes. Tests were then carried out in large volumes of milk heavily infected with typhoid, paratyphoid, diphtheria, *Streptococcus hemolyticus*, and *B. tuberculosis* of both human and bovine types, and pasteurized in three different types of commercial pasteurizing machines at 130° to 145° F.

It was found that typhoid, paratyphoid, and diphtheria bacilli and also the streptococci were killed within 10 minutes at temperatures ranging between 140° to 145° F. Some of the tubercle bacilli survived 10 minutes heating at the above temperatures, but were all destroyed after 20 minutes heating at 142° to 145° F. In all of these tests the milk was very heavily inoculated with the organisms tested—many times more heavily than it would be in an ordinary infection. Some of the positive results that we obtained in our tests we found on investigation to be due to faulty construction of the tanks which were tested. These defects have been remedied since as shown by our subsequent tests. Plans are at present in contemplation to test various other pasteurizing machines.

Little plate method of milk examination.—Further work on the Frost little plate method was done. Three hundred and fifty milk samples were tested by this method and by the standard plate method and comparative data obtained, also an additional series of 63 tests giving comparative results on the standard plate method, the Breed direct count, Ayres milk agar, and lactose agar. Another series of 34 tests gave comparative results on standard plate counts and duplicate plates made with Ayres milk agar. This work is still incomplete, but the results will be published within a short time.

Effect of stirring on milk counts.—A study of the effect upon the colony count of taking milk samples before and after stirring the can was continued. The average result of 77 further tests seemed to indicate a slightly lower count after stirring.

High count pasteurized milks were examined for the presence in large numbers of organisms capable of resisting the temperature of pasteurization. Tests were made on 48 high-count pasteurized milks; the cultures obtained from them were put through pasteurizing tests at the laboratory; very few resistant strains were found. This tends to show that resistance is seldom a factor where pasteurized milks are found to contain an excessive number of bacteria.

Brilliant green dye in vaccine.—Experiments with calf-seed virus treated with brilliant green dye have been continued. Passages have been made through 16 calves in which good takes have resulted. The finished virus continues to be satisfactory for human protection.

The effects of brilliant green dye as a wash for vaccine calves have been tried. The dye solution (1 to 10,000) is applied to the area just prior to vaccination and again at the time of collection. By this treatment the bacterial count has been reduced about 90 per cent. As a result of the reduction in bacterial count, gas-producing organisms are destroyed by the action of glycerin and phenol after two or three weeks in cold storage.

Differentiation of smallpox and chicken pox.—Work has been continued on the differentiation of smallpox and chicken pox by the reaction on normal and previously vaccinated rabbits, as suggested by Force and Beckwith. The results obtained are very irregular and seem to indicate that the method can not be relied upon as a means of differential diagnosis.

ANTHRAX.

Various methods of sterilizing hair contaminated with anthrax spores have been tried with the following results:

Free anthrax spores (in suspension) are not killed by exposure to lysol solutions up to 10 per cent at room temperature for times up to two hours.

Free anthrax spores (on cotton thread) killed by exposure to 2.5 per cent formaldehyde for 15 minutes at 104° F.

The following results were obtained with *anthrax spores on shaving brush (artificially contaminated)*: (a) Brush agitated in 2.5 per cent formaldehyde solution for one-half hour at room temperature—*spores not killed*. (b) Brush agitated in 2.5 per cent formaldehyde solution for one-half hour at 104° F.—*spores killed*. (c) Brush agitated in 3.7 per cent² formaldehyde solution for 1 minute and soaked for 20 hours in same solution at room temperature—*spores killed*. (d) Brush agitated in 10 per cent washing soda for one-half hour at room temperature—*spores not killed*. (e) Brush treated as in (a) followed by agitation in 3.7 per cent² formaldehyde solution for one-half hour at room temperature—*spores killed*.

(In the above tests the brushes were completely immersed in the solutions. Brushes were heavily inoculated, particularly at the base.)

Chlorine water.—Free spores suspensions in saline were killed by exposure to 0.1 per cent chlorine water for 15 minutes at room temperature.

Spores on cotton threads were killed by exposure to 0.1 per cent chlorine water for one-half hour at room temperature.

Spores in bundled hair (artificially contaminated): Exposure of the bundles to 0.1 per cent chlorine water for one-half hour at room temperature does not kill spores.

Spores in shaving brushes (artificially contaminated): Brush agitated in 0.1 per cent chlorine water for one-half hour and then soaked in the same solution for 20 hours. Spores not killed.

Effects of sodium hypochlorite solution.—Solutions containing free alkali (sodium carbonate) and those neutralized with boric acid, as recommended for Dakin solution, were tried. When the concentration is such as to contain 1 per cent total available chlorine (free and hypochlorite) the solutions exert a destructive action upon the hair. The action is more pronounced in the alkaline solutions.

Solutions of this concentration usually kill anthrax spores on cotton thread in two hours, but the action is not constant enough to be depended upon.

When mixed with anthrax spores in suspension the cloud produced by the spores disappears, the spores being destroyed in one-half hour.

Solutions containing 0.1 per cent total available chlorine do not kill spores up to four hours at room temperature.

Effect of autoclaving.—Hair, artificially contaminated and loosely packed in wire crates up to a depth of 1½ inches was heated in autoclave at 15 pounds pressure for 35 minutes. Tests for anthrax spores were negative.

² A 10 per cent dilution of commercial formalin.

TETANUS TOXIN-ANTITOXIN MIXTURE FOR ACTIVE IMMUNIZATION IN GUINEA PIGS.

The unit of tetanus antitoxin is ten times more potent in neutralizing toxin than the unit of diphtheria antitoxin; that is, one-tenth of a unit of tetanus antitoxin when mixed with 99 M. L. D.'s of tetanus toxin will protect a 350-gram guinea pig from acute tetanic death.

Theoretically, therefore, a full unit ought to protect a guinea pig against 990 M. L. D.'s of standard toxin. However, in multiple proportion this is not true.

In preparing the first mixture a tetanus toxin was selected which was three months old and contained, when used on August 6, 1920, 4,500 M. L. D.'s per cubic centimeter.

The first mixture was prepared by adding five units of tetanus antitoxin to each cubic centimeter of toxin. Theoretically, the amount used should give a mixture slightly overneutralized; however, this was not the case. Five cubic centimeters caused acute death in three days.

In October, 1920, the toxin had dropped to 4,000 M. L. D.'s per cubic centimeter. During October additional mixtures were prepared containing, respectively, 5.5, 6.3, 6.5, and 6.75 units to each cubic centimeter of toxin. Of these mixtures the first three caused acute death in guinea pigs when 5 cubic centimeters were given. The last two, which correspond to about 60 and 70 per cent more antitoxin than required to neutralize all the standard toxin, caused stiffness in guinea pigs with recovery (when 5 cubic centimeters were given). A mixture was then prepared containing 90 per cent of antitoxin instead of 70 per cent; 5 cubic centimeters of this mixture caused no stiffness in guinea pigs.

This overneutralized mixture was used for active immunization in guinea pigs as shown in the following table:

Results of a single immunizing dose of the overneutralized mixture of tetanus toxin-antitoxin.

[Injected October 29, 1920.]

Dose (cubic centimeters).	9 weeks later injected with 1.5 M. L. D. tetanus toxin.	Results.
One-tenth.....	1.5 M. L. D.....	Dead, 3 days.
Do.....	do.....	Dead, 4 days.
Do.....	do.....	Dead, 6 days.
Do.....	do.....	Dead, 5 days.
Do.....	do.....	Lived.
Do.....	do.....	Do.
One-fourth.....	do.....	Do.
Do.....	do.....	Do.
One-half.....	do.....	Do.
Do.....	do.....	Do.
5.....	do.....	Do.
Control.....	1 M. L. D.....	Dead, 4 days.

Definite evidences of active immunization are shown when only one injection is given and even when the mixture is somewhat over-neutralized.

The toxic mixtures first prepared in October, 1920, and kept in the refrigerator were retested on December 8, 1921. It was found that the one containing 5.5 units per cubic centimeter toxin, or 3.5 per cent over the theoretically required amount, caused stiffness in guinea pigs with 5 cubic centimeter doses, followed by recovery. This mixture when freshly prepared and tested in 5 cubic centimeter doses had caused death in four days.

To determine the active immunization value of this mixture a single injection of 0.1 cubic centimeter was given on January 25, 1922, to a set of 12 guinea pigs. Five months later 2 of the guinea pigs received, respectively, 2 and 4 M. L. D.'s of tetanus toxin; this was followed by no stiffness.

Twelve months after the single immunizing injection 3 guinea pigs of the set remained. These received 5 M. L. D.'s of tetanus toxin; no stiffness followed. Five days later these 3 received 50 M. L. D.'s without evidence of stiffness. One of the three received in addition 500 and 1,500 M. L. D.'s at intervals of five days without any stiffness developing.

It can not be considered, however, that these guinea pigs would have withstood the 1,500 M. L. D.'s if this amount had been given to them as the initial dose after the lapse of 12 months from the time of the immunizing dose. Guinea pigs actively immunized rapidly increase their immunity when increased injections are given at intervals.

Nevertheless considerable immunity was evidently developed and retained for one year after one injection of 0.1 cubic centimeter of an aged mixture that had caused in a 5 cubic centimeter dose definite stiffness in a guinea pig followed by recovery. One-tenth cubic centimeter of an M. L. D. of tetanus toxin will cause characteristic stiffness in guinea pigs; therefore, the injected guinea pigs which received the 2, 4, and 5 M. L. D.'s for their initial dose, in the test for immunity without developing any stiffness, would have withstood at least five times the amount given without dying acutely.

HEALTH OF THE NAVY.

The general morbidity rate for August compared favorably with midsummer experience in recent years. The all-cause admission rate for the month was 561 per 1,000 per annum. The median rate for August, 1920-1922, inclusive, is 662. The rate for disease, exclusive of accidents and injuries, was in the same way relatively favorable.

The all-disease rate for the month was 476 per 1,000 per annum. The three year August median rate was 579.

The accident rate since the first of the year has averaged 65 per 1,000 per annum, as against 60 for the corresponding period last year and 55 in 1921. This rate is higher than it should be and it indicates the necessity for publicity and watchfulness, because many of the injuries are caused by carelessness and are thus preventable.

The bronchitis and tonsillitis rates were about the same as earlier in the summer. Both diseases had the same rate—30 per 1,000 per annum in August. The usual seasonal increase in admissions for these diseases is not due until October or November.

Communicable diseases were more prevalent than they were in July. The increased incidence was due principally to mumps. Influenza was also more prevalent, the admission rate rising from 11 per 1,000 per annum in July to 15 in August. The rate for German measles rose from 1 in July to 5 per 1,000 per annum in August. This figure is higher than it has been in the summer for three years. The rate for mumps was double that for the previous month, increasing from 13 to 26. This rate is also more than double the August rates for 1920, 1921, and 1922.

The increase in the prevalence of influenza occurred notably in the fleet, battle fleet, and scouting fleet, but increased prevalence was also reported by the naval training station, Hampton Roads, Va., marine barracks, Parris Island, S. C., and marine barracks, Quantico, Va., southern Atlantic seaboard. The increase in the incidence of mumps and German measles occurred almost entirely among forces afloat, principally in the battle fleet.

The admission rate for malaria in August was not as high as might have been expected from previous experience.

One case of acute epidemic poliomyelitis occurred in the person of an ensign in New York, and proved fatal.

The following table shows rates per 1,000 per annum for the principal communicable diseases, August, 1923. For comparison, corresponding median rates are given for the same month, years 1918 to 1922, inclusive:

	August, 1918-1922.	August, 1923.		August, 1918-1922.	August, 1923.
Cerebrospinal fever....	0.12	0	Mumps.....	12.64	26.00
Diphtheria.....	1.93	.31	Pneumonia.....	3.55	3.03
German measles.....	.61	4.91	Scarlet fever.....	.70	.73
Influenza.....	11.74	15.45	Smallpox.....	.04	0
Malaria.....	25.72	16.60	Tuberculosis.....	4.37	1.88
Measles.....	1.52	6.68	Typhoid fever.....	.19	0

PUBLIC OPINION AND MEDICAL PROGRESS.

The following remarks are quoted from the Report of the Rockefeller Foundation, New York, 1923, by George E. Vincent, president of the foundation, entitled "A summary for the first decade."

"In democratic countries like the United States, Great Britain, Canada, and Switzerland the popular estimate of the social value of science, the general esteem in which scientific men are held, the willingness of legislative bodies and of private citizens to supply funds, and the readiness of leaders and people to accept and apply the results of scientific research are determining factors in the progress of knowledge. Unless the leaders of opinion and a substantial proportion of the adult population appreciate the aims and methods of science, understand something of the value of evidence, are familiar with reasoning processes, and are prepared to recognize the authority of disinterested experts, science can not attain the place it deserves or render the service of which it is capable. Chemical, electrical, and mechanical engineers have won distinction and recognition because their work is tangible and convincing both to the trained leader and to the man in the street. The medical scientist, with vastly more complex problems to solve, must ask for the support of a much more intelligent, imaginative, and sympathetic form of public opinion. For example, as preventive medicine gradually restricts or eliminates certain common diseases, the maladies which remain may be those relatively much more difficult to deal with. Unless the public appreciates this fact, doctors in the future may be plausibly but quite unjustly charged with being less efficient than their predecessors.

"On the whole, the response of popular governments, of democratic publics, and of individuals to the demands of modern medicine has been encouraging. Medical schools, teaching hospitals, and research institutes have been improved, multiplied, and supported by private gifts and public grants. Public-health activities have been widely extended; their efficiency has steadily increased; appropriations for them have rapidly mounted. Yet in spite of these evidences of at least popular acquiescence there are disheartening instances of an almost benighted ignorance. If there is any one thing that has been repeatedly demonstrated to the complete satisfaction of all well-trained minds capable of dealing logically with evidence it is that vaccination for smallpox affords an extraordinary immunity against that disease. In autocratic Germany before the war, thanks to a strict enforcement of vaccination, smallpox was almost unknown. In the United States, on the other hand, the disease is widely diffused; in some regions it is almost endemic. From time to time it breaks out in towns and cities. It is not uncommon for

individuals and groups to resist vaccination. Occasionally the law is defied and remains unenforced. Antivaccination societies carry on fanatical campaigns of misrepresentation, offering misleading statistics, invoking the authority of discredited physicians, citing unverified cases, and making emotional appeals. The very sincerity of such agitators is at once an evidence of mental instability in the population and an added danger to sound thinking and wise social policy.

“The question of animal experimentation, a vital necessity to medical research, has a direct bearing upon the relation of public opinion to scientific progress. If the antivivisectionists could have their way they would forbid by law procedures which have saved, and will in the future save, untold numbers of human lives by making possible modern surgery and our present knowledge of such diseases as diabetes, smallpox, tuberculosis, diphtheria, cerebrospinal meningitis, tetanus, puerperal fever, syphilis, rabies, bubonic plague, relapsing fever, cholera, and yellow fever. The only protection which medical science and social welfare have lies in the public opinion to which legislatures must in the long run defer. If the leaders of opinion, educational institutions, the press, the platform, women's clubs, popular forums, party organizations, and thinking citizens generally will take a positive aggressive interest, secure the facts, select and trust experts, reason clearly, and have the courage of conviction, modern scientific medicine will be appreciated and the common welfare promoted. There can be no serious doubt as to the outcome, because in spite of a noisy minority the great body of public opinion is sound.”

**REMARKS CONCERNING SYPHILIS AND THE YELLOW ABSTRACT SHEET
IN THE HEALTH RECORD.**

The yellow abstract sheet is intended to make follow-up measures more certain in the treatment of syphilis among enlisted men of the Navy. It provides a means for recording all essential ascertainable facts in such a manner that once recorded a definite history of syphilis will always be available to the medical officers of various commands which the man may subsequently join. This should insure continuous observation and the administration of all necessary treatment. This system should, for the most part, prevent the future development of that deplorable sequel to syphilis, general paralysis of the insane, and likewise to a great extent, some of the degenerative diseases of the vascular system and the important organs known or believed to follow syphilis.

Of course, a certain number of men who have had syphilis in the past, but have no manifest lesions at the time of enlistment, will get into the service.

Some of these cases will come to light later and some may not. If syphilis is recognized under any circumstances either because of active symptoms or because a complement fixation test made for any reason whatever proves positive and the diagnosis can be confirmed, it goes without saying a yellow abstract sheet should be opened and inserted in the health record. The man's signature should be obtained if he can be convinced that he has the disease.

Now, it happens not infrequently in the course of routine work in the Bureau of Medicine and Surgery that yellow abstract sheets attached to clinical history sheets, along with other abstract sheets, are found in the files of the bureau. In such instances the form or correspondence that made reference to the man's jacket necessary proves that he has reenlisted. This indicates that the medical officer of the ship or station has not examined the man's new health record with required care. If he or one of his assistants had done so, the fact of previous service would have been noted and the absence of abstracts covering such service would have been detected.

The inference in such cases is that medical department administration at the place in question does not adequately provide for systematic and careful examination of all new men joining the organization, with proper attention to health records as received. Otherwise the fact that abstracts are missing from the current record would have been noted and a request for them would have been made to the bureau. When the current health record is closed and it is known that a new record is to be opened in a day or two, all abstracts should be retained for insertion in the new record. Abstract sheets containing records of cowpox vaccination and typhoid prophylaxis should likewise be transferred to the new health record.

The importance of continuous observation and treatment of syphilis is one of those things that all medical officers recognize. It is also one of the activities in which laxity is detected from time to time.

The admission rate for paresis during the calendar year 1922 represented a 67 per cent increase over the median rate for recent years. The number of admissions for paresis each year is naturally small, 18 in 1922. Therefore a comparatively high admission rate in any one year may not mean a great deal, but the increase is sharply accentuated by the fact that many 16 and 20 year enlisted men left the active service in the summer of 1922. They were in age groups in which cases are most likely to develop among men previously

infected and it is altogether probable that a certain percentage of them were infected in former years. Other things being equal, their retirement from active service should have been followed by a reduction in the admission rate for paresis rather than an increase.

The fact that there was an increase, however much or little it may mean, coupled with the fact that syphilis abstract sheets for men now in service are reposing in the bureau should certainly serve to focus sharply the attention of all medical officers upon the need for careful follow-up work in the treatment of syphilis throughout the service.

A recent example of laxity in administration is illustrative. A fireman, second class, was admitted with chancroid September 20, 1916. Sixteen days later the diagnosis was changed to syphilis and confirmed at a naval hospital October 8, 1916. He received treatment in hospital for 32 days. The medical-history sheets in the bureau fail to show that he received any treatment for syphilis after he left the hospital. May 22, 1917, he was admitted to the sick list on board ship with a diagnosis chronic lead poisoning and immediately transferred to hospital, the same hospital where he had been treated for syphilis the previous year. No record of a complement fixation test was made. He was treated for lead poisoning until June 9, 1917, when he was discharged to duty with the notation, "Improved; does not need hospital care."

August 15, 1917, he was readmitted on board ship under the diagnosis "syphilis," and transferred to hospital three days later—another hospital. August 25, 1917, without specific treatment, his blood Wassermann test was negative but he had an ulcer in the sulcus back of the corona. September 10, he was given 0.6 gram of salvarsan. September 22, 1917, the blood Wassermann test was positive. A yellow syphilis abstract sheet was opened for him and he acknowledged by signing that he was convinced that he had syphilis. Thereafter, the administration of active antisyphilitic treatment was recorded until January 3, 1918 when he was discharged from hospital after negative blood Wassermann tests.

All through 1918 his treatment was followed up on board ship.

In January, 1919 he was admitted to the sick list on board ship with chronic bronchitis and transferred to hospital upon arrival in port, January 29. February 19, 1919 he gave a negative Wassermann test, and was returned to duty, recovered, February 28, 1919.

The following April he had a compound comminuted fracture of the little finger of his left hand and was again sent to hospital where he spent 40 days. No entry relative to syphilis was made during this period.

August 29, 1919 he was admitted to the sick list on board ship with diagnosis, "chancroid," without charging sick days.

In January, 1920 he was admitted to the sick list with inguinal hernia and transferred to hospital where it was noted that he presented a left sided inguinal hernia, noticed two months ago, but that his main condition was an ulcer on the middorsal sulcus. He gave a positive Wassermann test (2+). After treatment he gave a negative Wassermann test on March 24, 1920, and was discharged to duty April 3, having refused operation for hernia and not being in need of further hospital treatment for syphilis. Four days later he was returned to hospital where he accepted operation, was operated upon, and discharged to duty May 11, 1920.

He was discharged from the service August 6, 1920, upon expiration of enlistment. Since then all records in his case have remained uncalled for in the bureau. In due course a Form F card was received in the bureau showing that he had enlisted December 11, 1922 and that he had been admitted to the sick list, original admission (A) with syphilis, August 8, 1923.

VENEREAL DISEASE FROM THE STANDPOINT OF A STATE DEPARTMENT OF HEALTH—ILLINOIS ADOPTS NEW LAW.

The following paragraphs were taken from Illinois Health News, August, 1923, the official monthly bulletin published by the Illinois State department of health:

"In casting about for a 'cure all' or a panacea to apply to the ills of mankind one is tempted to conclude that a program for the absolute prevention of venereal diseases would be the nearest approach to that utopian achievement. Some of the celebrated medical authorities have declared that to know syphilis is to know medicine. All agree that the venereal diseases, especially syphilis, masquerade under the guise of all sorts of ailments only to beguile the patient and his doctor.

"The chief problem is, of course, the discovery of a practical preventive program. How can venereal diseases be prevented?

"All answers come back to the fundamental factor of education. After studying the problem for a year a royal British committee recently reported that there is no absolute and certain preventive against venereal diseases save that of continence. It catalogued the well-known sequelae of the venereal infections, pointed out again the tragedy of innocent victims, emphasized anew that the presence of venereal diseases is a menace to the maintenance and advancement of physical and intellectual standards of the race, and concluded that the greatest progress toward control and prevention may be expected from education.

"Laws are useful but they are definitely limited, reaching no further than public opinion dictates. Medical treatment is useful but it can begin only after disease has appeared. Prophylactic measures are useful but they require intelligent and almost immediate application.

"Any practical means of controlling and preventing venereal diseases depends, therefore, largely upon education. Young people must be taught where the dangers and pitfalls are and how to avoid them. Older people must break through the wall of secrecy, mystery, and false modesty sufficiently to permit the dissemination of correct knowledge to the rising generation. Boys and girls must be taught in the homes and schools or else they *will* learn in the streets and alleys.

NEW WEAPON AGAINST VENEREAL DISEASES.

"Responsibility for dealing with prostitution pretty generally passes lightly from one point of authority to another by common consent, on the ground that it is the province of 'the minister to keep people good, the police department to keep people straight, and the health department to keep people well.' The problem has now become everybody's business with the duty of solving it placed squarely upon the shoulders of local office holders.

"The last legislature passed a social hygiene law full of teeth and directed at the very heart of the venereal disease evil. If enforced, it will reduce very greatly the possibility of venereal disease infections. This, in turn, would make more and more unnecessary a large number of clinics for treating such diseases.

"The State department of public health is interested in the law, which is quoted below, because its enforcement will prevent venereal diseases and the prevention of these diseases will solve one of the greatest of all public health problems.

"Prostitution in all of its manifold forms is positively unnecessary with the new law at the command of city and county officials. It provides heavy fines and jail sentences for everyone proved to be definitely associated with this evil traffic.

"The new law came at an opportune time. Activity in Chicago is forcing the human parasites and leeches from that great city into the smaller downstate communities. Without this new and drastic weapon the people would find in their midst a terrible and deadly monster whose only mission is to destroy and kill.

"Two or three downstate cities have recently carried out effective clean-up campaigns. There is now no legitimate excuse for tolerating an organized 'red light' district or even a house used for dis-

orderly or ill-formed purposes in any municipality or county of the State.

"The provisions of the new law are broad and easily enforced. Decent, self-respecting citizens have only to demand its rigid enforcement if they would rid their community of every disorderly house and every 'street walker.'

"The new law is an amendment to section 57 of the criminal code and reads as follows:

"SEC. 57. Whoever keeps or maintains a house of ill fame or place for the practice of prostitution or lewdness, or whoever patronizes the same, or lets any house, room or other premises for any such purpose, or shall keep a common ill governed and disorderly house, to the encouragement of idleness, gambling, drinking, fornication, or other misbehavior, shall be fined not exceeding \$200, or imprisoned in the county jail or house of correction for a period of not more than one year or both. When the lessee or keeper of a dwelling house or other building is convicted under this section, the lease for contract for letting the premises shall, at the option of the lessor, become void, and the lessor may have the like remedy to recover the possession as against a tenant holding over after the expiration of his term. And whoever shall lease to another any house, room, or other premises, in whole or in part, for any of the uses or purposes punishable under this section, or knowingly permits the same to be so used or occupied, shall be fined not exceeding \$200, or imprisonment in the county jail or house of correction for a period of not more than one year, or both, and the house or premises so leased, occupied or used shall be held liable for and be sold for any judgment obtained under this section, but if such building or premises belongs to a minor or other person under guardianship, then the guardian or conservator and his property shall be liable instead of such ward, and his property shall be subject to be sold for the payment of such judgment.'"

ADDITIONAL REMARKS ON THE STERILIZATION OF MESS GEAR.

Information relating to the minimum period of exposure of mess gear in boiling water that is necessary for practical disinfection was published in the August number of this bulletin.

In his annual report for 1922 the fleet surgeon, United States fleet, commented on the general subject as follows:

Sputum-borne diseases are too prevalent aboard ship. Improper treatment of mess gear is responsible for part of it. The process of eating is one of exchange of food from plate to mouth for saliva from the mouth to plate. Present facilities for proper treatment of mess gear, in view of the rôle of

sputum in carrying disease, are inadequate. Inadequate (a) as to matériel, and (b) as to personnel.

(a) *Matériel.* The dishwashing facilities are so limited that it is almost, if not actually, a physical impossibility to properly clean and heat the dishes to a temperature necessary to kill disease germs certainly. The undersigned has pointed out that water bubbling in the dishwasher is not, as appears to be supposed, *boiling* water. Escape of steam through the water does raise the temperature, but observations on several dishwashers in actual use justify the statement that often the temperature does not even reach that necessary for pasteurization of milk. On one ship the medical officer felt confident that the dishes were being passed through *boiling* water. However, daily readings, taken for five days at 10-minute intervals during the dishwashing revealed *that the maximum temperature attained was 98° C., and the general average of these observations on the dishwashers was 78° C., although the water was bubbling.* It is recommended that an adequate number of efficient dishwashers be installed to enable sterilization of all mess gear after each meal and *that each be provided with a recording thermometer by which the performance of the machine may be recorded.*

(b) *Personnel.* Inadequacy of personnel consists principally in lack of sufficient instruction. Obviously additional matériel would call for additional personnel to operate it.

When the term, actively boiling water, is employed it is assumed that the water is heated by the circulation of steam through a pipe or coil in the bottom of the tank, like the arrangement in the ordinary hospital instrument sterilizer. If the tank water is heated by the injection of steam through an open or perforated pipe it is true that ebullition or even violent agitation of the water may occur while the temperature of the water remains far below the boiling point, 212° F.

It appears that some dishwashing tanks have been tampered with on board ship. Perforated steam pipes have been substituted for closed pipes because it has required an hour or more to boil the water when the tank is full, whereas by the injection of steam, within a few minutes the water is steaming and apparently boiling.

When it takes an unreasonably long time to boil a tank full of water, either the surface area of the heating coil is inadequate or a sufficiently high pressure is not maintained in the steam line supplying the scullery, or the difficulty is due to a combination of these conditions. The subject is of sufficient importance to present to the commanding officer with a view to correction if these faults exist.

Emphasis should be laid upon the importance of disinfecting the knives, spoons, and forks, as well as plates, bowls, and cups. Esthetic considerations should not intrude to the extent of requiring polishing by hand to avoid the somewhat poorer appearance of these implements when allowed to dry in the air, unless they can be wiped dry with a clean towel *after sterilization.* That is usually impracticable in the scullery on board ship. The interests of the public health are promoted by careful distinction between proper sanitary

cleanliness and ulterior requirements that place a taboo upon unavoidable streaking or some impairment in the luster of metal surfaces that occasionally occurs with air drying.

REVISED FORM F TO BE USED EXCLUSIVELY AFTER JANUARY 1, 1924.

It has been directed that paragraphs 2 and 3 of Bureau Circular Letter No. SDS. 124842 (73) of July 18, 1922, serial No. 199-1922, be disregarded after December 31, 1923, and that the revised Form F be used exclusively after the beginning of the new year. Form K will become obsolete and all blank copies of that report should be destroyed. The old Form F may still be used by hospitals to report supernumeraries and Veterans' Bureau patients.

The addition of the column headed "Taken up as" at the right of the revised Form F is of great value from the statistical viewpoint. This form, after being compared with the Form F cards indexed thereon and corrected, becomes a permanent record in the files of the Bureau of Medicine and Surgery. All original admissions will show on the revised Form F as well as the average complement; it will be seen, therefore, that at any time in future years, admission rates can be worked up for any disease or injury and for any particular ship or station or any grouping of personnel desired.

In the statistical section of the Bureau of Medicine and Surgery all diagnosis when finally determined, whether following "Diagnosis undetermined" or erroneous diagnoses, are carried back and substituted for the original admission. This procedure eliminates diagnoses subsequently proved wrong and it also credits the ship or station where the disability originated with an original admission under the correct diagnostic title as finally determined.

It has been necessary to advise medical officers so that their forms could be corrected. Hence, from time to time, medical officers have received instructions to make changes on their statistical records. The diagnostic titles affected by this correspondence were principally those coming under the "Classification of diseases and injuries of the Navy nomenclature" as follows:

Class VIII. Communicable diseases transmissible by oral and nasal discharges.

Class XI. Tuberculosis (all forms).

Class XII. Venereal diseases.

After January 1, 1924, all such corrections will be made on Forms F received by the bureau. These forms will then become accurate and complete records of admissions reported, and as noted above, a reliable source of statistical information.

NOTES FROM UNITED STATES NAVAL TRAINING STATIONS.

United States naval training station, San Diego, Calif.—Of the 391 recruits received during the month, 55, or 14.66 per cent, had disabilities for which they should have been rejected on examination for enlistment and for which transfer to the United States naval hospital, San Diego, Calif., as with "no disease," for disposition, was deemed advisable. Four hundred and eighty-two recruits were transferred from detention to the main barracks during the month. The detention camp being under canvas and the open and well-ventilated construction of the main station barracks, with the favorable weather conditions present in this vicinity, are extremely favorable for the health of the men under training.

The medical department is exceedingly well provided in the detention camp and at the main station with large commodious quarters, and is well equipped for its work in all particulars.

United States naval training station, naval operating base, Hampton Roads, Va.—Sanitary conditions throughout the training station were excellent during the month of July. There has been no more than the usual amount of illness and nothing of communicable nature other than sporadic cases of measles has been presented. Of course, the training station participates in the pest of mosquitoes which has arisen and increased during the month because of the excessive rains, which have produced a prodigious growth of underbrush in the territory south of the base. A few cases of malaria have appeared among marines returning from the West Indies, but the mosquito pest has not resulted in any widespread outbreak. Great care is used in screening each individual case.

United States naval training station, Newport, R. I.—The sanitary condition of this station in its various aspects, with few minor exceptions, has been excellent. Although climatic conditions have resulted in a greater percentage of cloudy and foggy weather than bright sunny days, the major part of drilling and training of recruits has been accomplished in the open air. Climatic conditions have not interfered with outdoor athletic exercises, various games, or liberty. The morale of this station is excellent and the type of recruit is improving in quality. The number of recruits under training increased noticeably during July and the accommodations of barracks A detention unit were overtaxed to the extent of making it necessary to open a dormitory in barracks B. Only senior companies were transferred there. The general mess is located in barracks B and the recruits under detention were accordingly segregated at mess and ate at a different hour from the general mess.

Six hundred and seventy-five recruits were received and reexamined during July, 1923. Ten of the above number were found to

be not physically desirable for retention in the service and were accordingly transferred to the United States Naval Hospital, Newport, R. I., for further disposition. Three recruits presented venereal sores upon reexamination which were positive for *treponema pallida* by dark field examination and Fontana's stain. A general laxity and carelessness at recruiting stations is manifested by the character of the physical disabilities met with upon reexamination among those recruits that are found to be physically undesirable. As this condition affects the service adversely from a financial standpoint, the medical officer has decided in the future to report all improper enlistments in detail, stating name of recruit, place of enlistment, and medical officer concerned in each case.

The general activities of the receiving department during July included:

Vaccinations	749
Primary reactions	72
Accelerated	531
Immune reactions	146
Percentage of successful vaccinations.....	80½

The unusually high percentage of "takes" is due to the efficient strain of the vaccine supplied. There were 22 cases of vaccinia necessitating admission to the sick list.

Antityphoid inoculations given.....	1,914
Antityphoid inoculations completed.....	601
Severe reactions from antityphoid inoculations necessitating treatment in bed	119

The sterilization of the mess gear for all of barracks A is performed under the supervision of the medical department.

The routine activities at the receiving building include the following schedule to be followed in the case of each recruit:

Bath and hair cut.

Issue of soap, towel, suit of underwear, one clean suit of white uniform (old).

Detention record made out.

Civilian clothing sterilized and stowed for future return to the recruit when he leaves the department.

Reexamination, physical, noting evidences of constitutional inferiority.

Oral instruction by medical officer to the recruit on the subjects of syphilis, dark-field diagnosis of syphilis, gonorrhea, prophylactic tubes, tattooing, personal hygiene, habit-forming drugs, definition of diseases resulting from own misconduct.

Recruits arriving during the night or late afternoon are quartered in the receiving building. Thirty standard hospital beds are available, and clean linen is supplied to each recruit.

The dental chart is executed at the receiving building upon the day of arrival. Oral instruction by a dental officer is given each recruit on the subjects of dental hygiene and the care and preservation of the teeth.

The senior company of barracks A is given instruction by a medical officer in first-aid treatment prior to transfer to barracks C.

VITAL STATISTICS.

The Monthly Health Index, which is published on the 15th of each month, contains the statistical data for individual ships and shore stations. The statistics appearing in this BULLETIN are summaries compiled from those published in the Monthly Health Index.

Annual rates, shown in the succeeding statistical table, are obtained as follows:

The total number of admissions to the sick list or the number of deaths reported during the period indicated is multiplied by $\frac{12}{7}$ or $\frac{5}{2}$ or 12, depending upon whether the period includes four or five weeks or a calendar month. The product is then multiplied by 1,000 and divided by the average complement.

E. R. STITT.

TABLE NO. 1.—*Monthly report of morbidity in United States Navy and Marine Corps for the month of August, 1923.*

	Forces afloat.	Forces ashore.	Entire Navy.	Marine Corps.
Average complement.....	73,663	41,275	114,938	20,215
All causes:				
Number of admissions.....	2,780	2,411	5,191	879
Annual rate per 1,000.....	452.87	700.96	541.96	565.27
Disease only:				
Number of admissions.....	2,447	2,116	4,563	771
Annual rate per 1,000.....	398.63	615.19	476.40	496.82
Communicable diseases, exclusive of venereal disease:				
Number of admissions.....	536	266	802	151
Annual rate per 1,000.....	87.31	77.34	83.73	97.10
Venereal disease:				
Number of admissions.....	167	64	231	165
Annual rate per 1,000.....	27.20	18.61	24.12	106.11
Injuries and poisons:				
Number of admissions.....	333	295	628	108
Annual rate per 1,000.....	54.25	85.77	65.57	69.45

TABLE NO. 2.—*Number of admissions reported by Form F cards or certain diseases for the month of August, 1923.*

	Forces afloat, Navy and ma- rines (comple- ment, 73,663).		Forces ashore, Navy and ma- rines (comple- ment, 41,275).		Total (complement, 114,938).	
	Number of admis- sions.	Annual rate per 1,000.	Number of admis- sions.	Annual rate per 1,000.	Number of admis- sions.	Annual rate per 1,000.
Diseases.....	2, 447	398.63	2, 116	615.19	4, 563	476.40
Injuries and poisons.....	333	54.25	295	85.77	628	65.57
Total admissions.....	2, 780	452.87	2, 411	700.96	5, 191	541.96
Class III:						
Appendicitis, acute.....	44	7.17	46	13.37	90	9.40
Autointoxication, intestinal.....	7	1.14	8	2.33	15	1.57
Cholangitis, acute.....	18	2.93	10	2.91	28	2.92
Cholecystitis, acute.....	0	0	1	.29	1	.10
Cholelithiasis.....	1	.16	0	0	1	.10
Colitis, acute.....	1	.16	4	1.16	5	.52
Constipation.....	20	3.26	35	10.18	55	5.74
Enteritis, acute.....	37	6.03	26	7.56	63	6.58
Gastritis, acute catarrhal.....	6	.98	7	2.04	13	1.36
Gastroenteritis.....	35	5.70	69	20.06	104	10.86
Hemorrhoids.....	19	3.10	22	6.40	41	4.28
Pharyngitis, acute.....	8	1.30	18	5.23	26	2.71
Ulcer of duodenum.....	1	.16	3	.87	4	.42
Ulcer of stomach.....	4	.65	0	0	4	.42
Total.....	201	32.74	249	72.39	450	46.98
Class VII:						
Varicocele.....	7	1.14	20	5.80	27	2.82
Class VIII:						
Chicken pox.....	2	.33	3	.87	5	.52
Diphtheria.....	2	.33	1	.29	3	.31
German measles.....	45	7.33	2	.58	47	4.91
Influenza.....	118	19.22	30	8.72	148	15.45
Measles.....	42	6.84	22	6.40	64	6.68
Mumps.....	232	37.79	17	4.94	249	26.00
Pneumonia, broncho.....	11	1.79	5	1.45	16	1.67
Pneumonia, lobar.....	7	1.14	6	1.74	13	1.36
Scarlet fever.....	4	.65	3	.87	7	.73
Total.....	463	75.42	89	25.88	552	57.63
Class IX:						
Dysentery, entamebic.....	1	.16	0	0	1	.10
Class X:						
Dengue.....	5	.81	66	19.19	71	7.41
Filariasis.....	0	0	1	.29	1	.10
Malaria.....	57	9.29	102	29.65	159	16.60
Total.....	62	10.10	169	49.13	231	24.12
Class XI:						
Tuberculosis (all forms).....	10	1.63	8	2.33	18	1.88
Class XII:						
Chancroid.....	167	27.20	64	18.61	231	24.12
Gonococcus infection.....	496	80.80	230	66.87	726	75.80
Syphilis.....	29	4.72	19	5.52	48	5.01
Total.....	692	112.72	313	91.00	1,005	104.93
Class XVII:						
Bronchitis, acute.....	126	20.53	164	47.68	290	30.28
Laryngitis, acute.....	1	.16	4	1.16	5	.52
Pleurisy, acute fibrinous.....	6	.98	5	1.45	11	1.15
Rhinitis, acute.....	4	.65	15	4.36	19	1.98
Tonsillitis, acute follicular.....	207	32.72	83	24.13	290	30.28
Total.....	344	56.04	271	78.79	615	64.21
Class XX:						
Herniae.....	31	5.05	24	6.98	55	5.74

TABLE NO. 3.—Summary of annual admission rates for venereal diseases reported from ships for July and from various shore stations for the four-week period August 5 to September 1, 1923.

	Annual rate per 1,000, July.			Average rate since Jan. 1, 1923.		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All ships.....	0	164.49	1,245.28	0	150.34	1,371.43
Battleship divisions—						
Battle Fleet.....	66.98	117.89	148.47	73.59	94.69	120.83
Scouting Fleet.....	49.06	163.49	281.42	100.12	142.50	151.43
Asiatic Fleet.....	0	756.76	1,125.00	166.67	656.25	1,371.43
Destroyer squadrons—						
Battle Fleet.....	0	93.28	391.30	16.81	91.01	214.92
Scouting Fleet.....	0	178.98	650.60	31.05	201.93	356.04
Asiatic Fleet.....	0	305.52	394.74	124.35	447.43	1,226.67
Miscellaneous ¹ —						
Battle Fleet.....	0	107.57	488.79	0	140.55	264.70
Scouting Fleet.....	0	143.28	413.79	72.29	171.56	374.19
Asiatic Fleet.....	0	338.60	672.90	111.80	534.53	1,050.27
Naval forces, Europe.....	0	252.67	1,245.28	0	235.20	885.91
Special service squadron, based on Panama.....	123.08	234.98	398.79	190.16	241.38	381.12
Naval transportation service.....	0	126.98	502.99	77.67	148.35	294.98
Special duty.....	0	229.51	615.38	0	229.51	502.15
Miscellaneous and district vessels.....	0	142.23	750.00	0	142.23	320.00

	Annual rate per 1,000, Aug. 5 to Sept. 1, 1923.			Average rate since July 1, 1923.		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All naval districts in the United States....	0	63.60	272.13	0	73.04	287.08
First naval district.....	13.12	50.24	122.64	24.13	55.59	104.12
Third naval district.....	0	41.81	115.38	11.57	43.14	85.96
Fourth naval district.....	19.06	173.63	292.13	8.71	152.11	287.08
Fifth naval district.....	0	72.56	92.71	0	80.82	115.38
Sixth naval district.....	25.57	31.12	89.04	57.71	72.27	256.52
Seventh naval district.....	0	0	0	0	0	0
Eighth naval district.....	0	12.29	89.47	27.71	28.41	31.53
Ninth naval district.....	76.16	76.16	76.16	133.52	133.52	133.52
Eleventh naval district.....	6.94	23.09	136.84	12.27	27.91	97.56
Twelfth naval district.....	12.30	46.46	101.50	21.09	51.21	97.76
Thirteenth naval district.....	0	171.05	160.49	24.17	110.37	257.00

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE.

	Per cent, July.		Per cent since Jan. 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All ships.....	71.34	7.39	67.35	7.94
Battleship divisions—				
Battle Fleet.....	90.85	6.71	77.17	10.02
Scouting Fleet.....	82.65	4.08	70.91	8.39
Asiatic Fleet.....	41.07	11.61	45.36	8.93
Destroyer squadrons—				
Battle Fleet.....	92.68	2.44	78.71	3.80
Scouting Fleet.....	63.49	4.76	63.42	8.32
Asiatic Fleet.....	55.55	16.67	62.74	6.27
Miscellaneous ¹ —				
Battle Fleet.....	91.67	2.78	68.20	8.11
Scouting Fleet.....	69.23	9.61	62.29	6.68
Asiatic Fleet.....	40.00	24.00	52.15	7.65
Naval forces, Europe.....	59.70	7.46	56.43	5.94
Special service squadron, based on Panama.....	68.96	0	69.84	1.59
Naval transportation service.....	72.50	10.00	51.54	6.59
Special duty.....	66.67	9.52	66.67	9.52
Miscellaneous and district vessels.....	73.68	0	73.68	0

¹ Vessels of train, base, air squadrons, etc.

TABLE No. 3.—*Summary of annual admission rates for venereal diseases reported from ships for July and from various shore stations for the four-week period August 5 to September 1, 1923—Continued.*

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE—Continued.

	Per cent, Aug. 5 to Sept. 1, 1923.		Per cent since July 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All naval districts in the United States.....	75.00	13.57	78.27	9.52
First naval district.....	70.59	29.41	75.00	20.45
Third naval district.....	71.43	0	75.00	6.25
Fourth naval district.....	71.43	1.73	77.78	11.11
Fifth naval district.....	75.00	11.54	77.52	4.30
Sixth naval district.....	75.00	0	69.57	0
Seventh naval district.....	0	0	0	0
Eighth naval district.....	100.00	0	60.00	0
Ninth naval district.....	53.84	20.77	76.92	12.82
Eleventh naval district.....	66.67	16.67	61.54	7.70
Twelfth naval district.....	100.00	0	93.75	0
Thirteenth naval district.....	100.00	0	100.00	0

TABLE No. 4.—*Number of admissions reported by Form F cards and annual rates per 1,000, entire Navy, for the four-week period August 5 to September 1, 1923, inclusive.*

Classes.	Navy (complement, 94,723).		Marine Corps (complement, 20,215).		Total (complement, 114,938).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases of blood.....	1	0.14	0	0	1	0.11
Diseases of circulatory system.....	25	3.43	7	4.50	32	3.62
Diseases of digestive system.....	447	61.35	134	86.17	581	65.71
Diseases of ductless glands and spleen.....	2	1.27	0	0	2	.23
Diseases of ear.....	74	10.16	12	7.72	86	9.73
Diseases of eye and adnexa.....	52	7.14	11	7.07	63	7.13
Diseases of genito-urinary system (non-venereal).....	131	17.98	19	12.22	150	16.97
Communicable diseases transmissible by oral and nasal discharges.....	504	69.17	37	23.79	541	61.19
Communicable diseases transmissible by intestinal discharges.....	1	.14	0	0	1	.11
Communicable diseases transmissible by insects and other arthropods.....	132	18.12	111	71.38	243	27.48
Tuberculosis (all forms).....	12	1.65	3	1.93	15	1.70
Venereal diseases.....	786	107.87	165	106.11	951	107.56
Other diseases of infective type.....	222	30.47	53	34.08	275	31.10
Diseases of lymphatic system.....	51	7.00	12	7.72	63	7.13
Diseases of mind.....	26	3.57	9	5.79	35	3.96
Diseases of motor system.....	60	8.23	12	7.72	72	8.14
Diseases of nervous system.....	43	5.90	12	7.72	55	6.22
Diseases of respiratory system.....	644	88.38	111	71.38	755	85.39
Diseases of skin, hair, and nails.....	58	7.96	15	9.65	73	8.26
Hernia.....	43	5.90	8	5.14	51	5.77
Miscellaneous diseases and conditions.....	124	17.02	27	17.36	151	17.08
Parasites (fungi and certain animal parasites).....	131	17.98	10	6.43	141	15.95
Tumors.....	7	.96	3	1.93	10	1.13
Diseases of women.....	2	.27	0	0	2	.23
Injuries.....	459	62.99	95	61.09	554	62.66
Poisons.....	45	6.18	13	8.36	58	6.56
Total.....	4,082	560.22	879	565.27	4,961	561.11

TABLE No. 5.—Deaths reported, entire Navy, for the four-week period August 5, 1923, to September 1, 1923, inclusive.

Cause.	Navy (strength, 97,723).	Marine Corps (strength, 20,215).	Total (strength, 114,938).
Meningitis, cerebrospinal	1	0	1
Tuberculosis, chronic pulmonary	1	0	1
Poliomyelitis, ac. anterior	1	0	1
Syphilis	2	0	2
Typhoid fever	1	0	1
Other diseases	1	2	3
Electric shock	1	0	1
Drowning	4	0	4
Other accidents and injuries	9	1	10
Total	21	3	24
Annual death rate per 1,000, all causes	2.88	1.93	2.71
Annual death rate per 1,000, diseases only	2.33	1.29	2.15

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VOL. XIX

NO. 5

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PLANNING AND PUBLICATIONS
CAPTAIN D. N. CARPENTER, MEDICAL CORPS, U. S. NAVY
IN CHARGE

EDITED BY
LIEUTENANT COMMANDER W. M. KERR, MEDICAL CORPS, U. S. NAVY

NOVEMBER, 1923
(MONTHLY)



Compiled and published under authority of Naval Appropriation Act for 1924
approved January 22, 1923

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

Owing to the exhaustion of certain numbers of the BULLETIN and the frequent demands from libraries, etc., for copies to complete their files, the return of any of the following issues will be greatly appreciated:

Volume VII, No. 2, April, 1913.
Volume VIII, No. 1, January, 1914.
Volume VIII, No. 3, July, 1914.
Volume VIII, No. 4, October, 1914.
Volume X, No. 1, January, 1916.
Volume XI, No. 1, January, 1917.
Volume XI, No. 3, July, 1917.
Volume XI, No. 4, October, 1917.
Volume XII, No. 1, January, 1918.
Volume XII, No. 3, July, 1918.

SUBSCRIPTION PRICE OF THE BULLETIN.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Yearly subscription, beginning January 1, \$1.50; for foreign subscription add \$1.00 for postage.

Single numbers, domestic, 15 cents; foreign, 24 cents, which includes foreign postage.

Exchange of publications will be extended to medical and scientific organizations, societies, laboratories, and journals. Communications on this subject should be addressed to the Surgeon General, United States Navy, Washington, D. C.

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PREFACE.

THE UNITED STATES NAVAL MEDICAL BULLETIN was first issued in April, 1907, as a means of supplying medical officers of the United States Navy with information regarding the advances which are continually being made in the medical sciences, and as a medium for the publication of accounts of special researches, observations, or experiences of individual medical officers.

It is the aim of the Bureau of Medicine and Surgery to furnish in each issue special articles relating to naval medicine, descriptions of suggested devices, clinical notes on interesting cases, editorial comment on current medical literature of special professional interest to the naval medical officer, reports from various sources, historical essays, notes and comments on topics of medical interest, and reviews or notices of the latest published medical books.

The bureau extends an invitation to all medical officers to prepare and forward, with a view to publication, contributions on subjects of interest to naval medical officers.

In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will send a letter of commendation to authors of papers of outstanding merit and will recommend that copies of such letters be made a part of the official records of the officers concerned.

The bureau does not necessarily undertake to indorse all views or opinions which may be expressed in the pages of this publication.

E. R. STITT,
Surgeon General United States Navy.

NOTICE TO SERVICE CONTRIBUTORS.

When contributions are typewritten, *double spacing* and wide margins are desirable. Fasteners which can not be removed without tearing the paper are an abomination. A large proportion of the articles submitted have an official form, such as letterheads, numbered paragraphs, and needless spacing between paragraphs, all of which require correction before going to press. The BULLETIN endeavors to follow a uniform style in headings and captions, and the editor can be spared much time and trouble and unnecessary errors can be obviated if authors will follow in the above particulars the practice of recent issues.

The greatest accuracy and fullness should be employed in all citations, as it has sometimes been necessary to decline articles otherwise desirable, because it was impossible for the editor to understand or verify references, quotations, etc. The frequency of gross errors in orthography in many contributions is conclusive evidence that authors often fail to read over their manuscripts after they have been typewritten.

Contributions must be received two months prior to the date of the issue for which they are intended.

The editor is not responsible for the safe return of manuscripts and pictures. All materials supplied for illustrations, if not original, should be accompanied by a reference to the source and a statement as to whether or not reproduction has been authorized.

The BULLETIN intends to print *only original articles, translations, in whole or in part, reviews, and reports and notices of Government or departmental activities, official announcements, etc.* All original contributions are accepted on the assumption that they have not appeared previously and are not to be reprinted elsewhere without an understanding to that effect.

U. S. NAVAL MEDICAL BULLETIN

VOL. XIX.

NOVEMBER, 1923.

No. 5

SPECIAL ARTICLES.

AN ANALYSIS OF 360 CASES OF VALVULAR HEART DISEASE DISCHARGED FROM THE NAVAL SERVICE.

By W. A. BLOKORN, Lieutenant Commander, and L. J. ROBERTS, Lieutenant, Medical Corps, United States Navy.

During the years 1921 and 1922 there were 360 cases of valvular disease, chronic cardiac, surveyed and discharged from the naval service. It appeared to us that an analysis of these cases might be of interest, and we have attempted to classify them in order that it might be possible to draw some conclusions regarding this interesting group.

Table 1 shows these patients classified according to time in service. Checking up the naval service of these patients, we find that 86, or 23.9 per cent, had less than one month of service, and that 167, or 46.5 per cent, had less than six months' service.

It is quite evident from these figures that almost half of these patients were probably enlisted with the same defect present that later caused their discharge from the service.

Table 2 shows these patients classified according to age. It appears that 145, or 43 per cent, were under 20 years of age, and that 337, or 95 per cent, were under 30 years of age. These figures bear out the preceding table and also tend to indicate that the majority of these cases were recruits.

Table 3 shows cases classified according to the station from which they were discharged. Approximately 60 per cent were discharged from naval hospitals and about 35 per cent from naval training stations.

Table 4 shows these patients classified according to etiology. A careful search of the patients' records showed that 101, or 28 per cent, had a history of rheumatic fever, and that 59, or 16.4 per cent, gave a history of several attacks of tonsillitis.

In 184 cases, or 51 per cent, no etiologic factor was noted.

TABLE 1.—Cases classified according to time in service.

Time in service.	Number.	Per cent.
0 to 1 month.....	86	23.9
1 to 3 months.....	37	10.4
3 to 6 months.....	44	12.2
6 to 12 months.....	54	15.0
1 to 5 years.....	122	34.0
Over 5 years.....	17	4.7

TABLE 2.—Showing cases classified according to age.

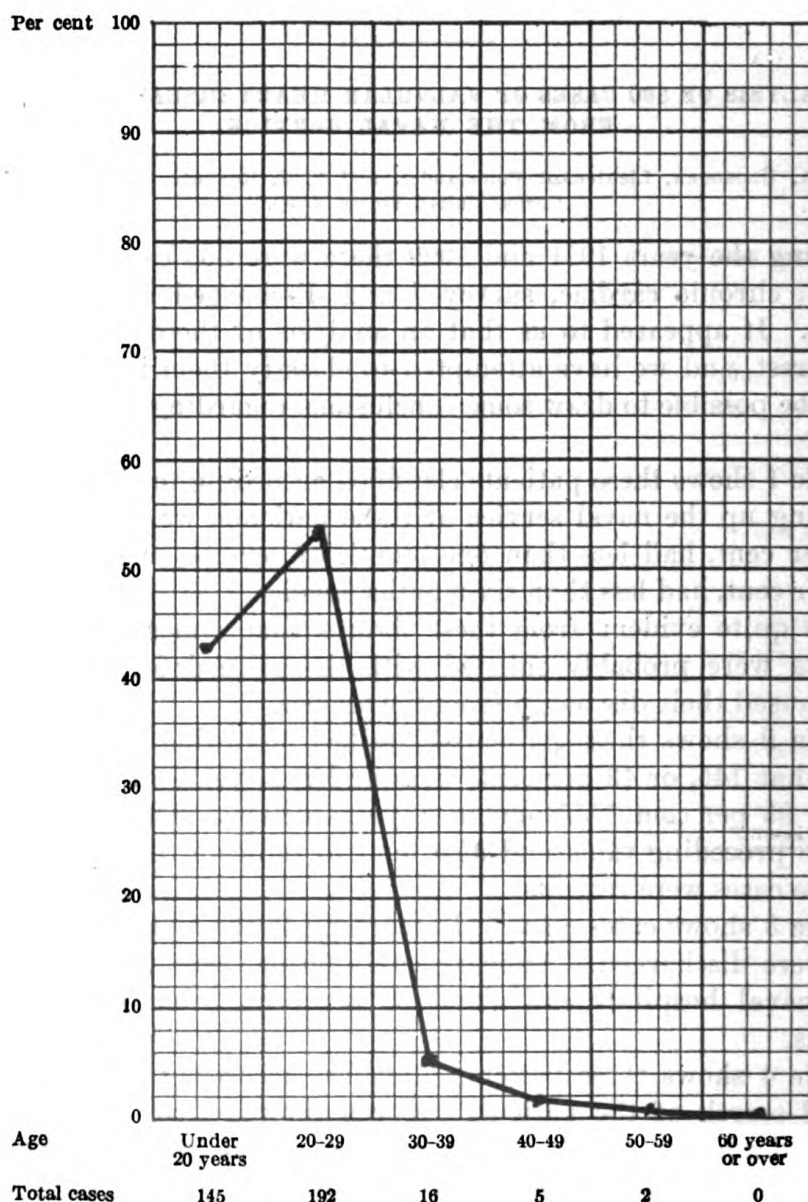


TABLE 3.—*Cases classified according to stations.*

Station.	Number.	Per cent.
All hospitals.....	215	59.7
Naval training stations:		
Great Lakes.....	28	7.8
Hampton Roads.....	45	12.0
Newport.....	21	5.8
Mare Island.....	32	8.9
Other ships and stations.....	19	5.3

TABLE 4.—*Cases classified according to etiology.*

Etiology.	Number.	Per cent.
Rheumatic fever.....	101	28.0
Tonsillitis.....	59	16.4
Pneumonia.....	4	1.1
Influenza.....	4	1.1
Syphilis.....	3	.83
Scarlet fever.....	2	.55
Sinusitis.....	1	.27
Pneumococcus septicemia.....	1	.27
Measles.....	1	.27
Chorea.....	1	.27
None given.....	184	51.1

It appears from Table 4 that rheumatic fever heads the list, as is usual in valvular disease of the heart. This raises the rather interesting point as to whether a definite history of rheumatic fever should in itself constitute a cause for rejection for the naval service. It is probably true that from 40 to 50 per cent of all rheumatic-fever patients develop endocarditis. In fact, it has been suggested that endocarditis is the primary lesion in all cases of rheumatic fever and that the joint involvement is secondary to such infection. The advocates of this viewpoint state that this would account for the large number of cases of valvular disease of the heart in which no etiologic factor can be demonstrated. They point out that in the absence of joint involvement the infection is limited to the endocardium and that it is only in cases in which the joints are affected secondarily that the symptoms of rheumatic fever develop.

This is a most interesting hypothesis, but at the present time is not generally accepted. Nevertheless, the great frequency with which heart disease accompanies or follows acute rheumatic fever would probably justify the recruiting officer in rejecting an applicant as unfit for naval service who gives a definite history of rheumatic fever. This procedure would no doubt safeguard the interests of the service and avoid conservatively from 25 to 35 per cent of all cases discharged for valvular disease, chronic cardiac.

Table 5 shows patients classified according to symptoms. The most common symptom complained of was dyspnea, which occurred in 141, or 39.1 per cent of cases. The next most common complaint was precordial pain, which occurred in 74, or 20.5 per cent of cases. In 171, or 47.5 per cent of cases, there was no mention of any symptoms of which patient complained.

TABLE 5.—*Cases classified according to symptoms.*

Symptom.	Number.	Per cent.
Dyspnea.....	141	39.1
Precordial pain.....	74	20.5
Palpitation.....	26	7.2
Dizziness.....	18	5.0
Weakness.....	8	2.2
Cough.....	6	1.7
Fatigue.....	4	1.1
Fainting.....	4	1.1
Tachycardia on exertion.....	2	.55
None mentioned.....	171	47.5

It appears to be true that the most prominent symptom in cardiac patients with beginning cardiac insufficiency is dyspnea, and this symptom in itself should call for an examination of the cardiovascular system. In other words, these patients first noticed their inability to carry on their ordinary routine duties with the same ease that they could formerly do their routine work. This, of course, is also the first symptom in many other diseases, as, for instance, chronic nephritis, hyperthyroidism, malignancy, and anemia.

The fact that 171 or almost half of these patients had no symptoms whatever is good evidence that there was no insufficiency of the cardiac muscle. In fact, it is safe to assume that a fair percentage had no knowledge of any heart lesion being present. This raises another interesting point, to wit, should an individual already in the naval service be immediately surveyed and discharged when the diagnosis of a valvular lesion is made, even though there may be no evidence of any cardiac insufficiency whatever? Many of these patients could probably render years of service without any visible evidence of physical disability. This question is particularly pertinent in individuals who have completed one or more enlistments and who, in the course of routine examination, are considered to have valvular heart disease. It would appear reasonable in these cases to withhold medical survey or hospitalization until some definite indication for this procedure is manifest.

In the case of the recruit, however, the situation is somewhat different and it would probably serve the interests of the service better to immediately discharge a recruit rather than to continue through his period of preliminary training.

TABLE 6.—*Cases classified according to physical evidence of decompensation.*

Evidence of decompensation.	Number.	Per cent.
Edema.....	18	5.0
Cyanosis.....	8	2.2
Congestion of viscera.....	2	.6
Physical signs present, nature not given.....	11	3.1
None.....	36	10.0
Not mentioned.....	285	79.2

Table 6 shows cases classified according to physical evidence of decompensation. In 18, or 5 per cent of the cases, edema was present; in 8, or 2.2 per cent, cyanosis was present. In 321, or 89.2 per cent, there was no evidence of decompensation. This bears out the findings in the preceding table and establishes the fact that the great majority of these patients did not show any evidence of cardiac insufficiency.

Table 7 shows these patients classified according to pulse findings. The most striking thing about this table is the fact that in 261, or 72.5 per cent of cases, the pulse rate was not mentioned; in 321, or 89.2 per cent, the rhythm was not mentioned; and in 349, or 96.9 per cent of cases, the quality of the pulse was not described. While the pulse in many cases of valvular disease is not particularly significant, in certain other cases it is quite important, and it is believed that all cases in which the diagnosis of valvular disease has been made should include in the record of the physical examination accurate observations as to the rate, rhythm, and quality of the pulse.

Table 8 shows these patients classified according to the blood pressure. The most significant fact in this table is that in 315, or 87.5 per cent of cases, there was no record of a blood-pressure observation. Whether or not the blood pressure was checked in these cases is doubtful, and it would appear highly desirable that every case of this character should have an accurate blood-pressure observation made, the result of which should be incorporated in the report of his physical examination.

TABLE 7.—*Cases classified according to state of the pulse.*

	Number.	Per cent.
Rate:		
Normal.....	9	2.5
Rapid.....	89	24.7
Slow.....	1	.27
Not described.....	261	72.5
Rhythm:		
Regular.....	8	2.2
Irregular.....	31	8.6
Not described.....	321	89.2

TABLE 7.—*Cases classified according to state of the pulse—Continued.*

	Number.	Per cent.
Quality:		
Normal.....	1	.27
Water hammer.....	8	2.2
Weak.....	2	.55
Not described.....	349	96.9

TABLE 8.—*Cases classified according to blood pressure.*

Blood pressure.	Number.	Per cent.
Elevated.....	5	1.4
Large pulse pressure.....	14	3.9
Normal.....	26	7.2
Not given.....	315	87.5

TABLE 9.—*Cases classified according to evidence of cardiac hypertrophy.*

Hypertrophy.	Number.	Per cent.
Enlarged.....	162	45
Not enlarged.....	11	3
No statement as to enlargement made.....	187	52

Table 9 shows cases classified according to the evidence of cardiac hypertrophy. In 162, or 45 per cent of cases, the heart was considered to be enlarged, and in 11, or 3 per cent, the heart was stated to be not enlarged. In 187, or 52 per cent, there was no statement made as to the size of the heart. This in itself may be regarded as a defect in the record of the physical examination of these patients. It is considered that every case of this character should be examined to determine whether or not hypertrophy exists and, if it can not be determined in any other way, the actual transverse diameter can be obtained by teleoroentgenograms. The majority of these patients were discharged from naval hospitals where X rays were available.

Table 10 shows cases classified according to the nature of the heart sounds. The most significant finding in this table is the fact that in 317, or 88.1 per cent of cases, the nature of the heart sounds is not described. The question of the character of the heart sounds is most important, ranking only second, perhaps, to the cardiac murmur itself. It is believed that in every case of valvular disease the physical examination should include an accurate description of the sounds at the apex, over the aortic region, and over the pulmonary region.

Table 11 shows cases classified according to murmurs. First, as regards the character of the murmur, it appears that this was not mentioned in 195, or 54.16 per cent of cases. In 80, or 22 per cent, the murmur was described as blowing in character, and in 54, or 15 per cent, it was described as loud. In 32, or 8 per cent, it was described as soft and in 10, or 2 per cent, as harsh in character. Second, as regards the time of the murmur, in 269, or 74.7 per cent of cases, the murmur was systolic in time; in 29, or 8 per cent, diastolic; in 19, or 5 per cent, presystolic. In 67, or 18.6 per cent, the time of the murmur was not mentioned. In 38 cases, or 10.6 per cent, there was no mention of a murmur, and in one case the definite statement was made that no murmur was present.

TABLE 10.—Cases classified according to nature of heart sounds.

Heart sounds.	Number.	Per cent.
First sound at apex:		
Loud.....	1	0.27
Weak.....	1	.27
Snapping.....	4	1.1
Rough.....	2	.55
Reduplicated.....	1	.27
Absent.....	1	.27
Aortic second sound accentuated.....	9	2.5
Pulmonary second sound accentuated.....	35	9.7
Rough.....	1	.27
Nature of heart sounds not described.....	317	88.1

TABLE 11.—Cases classified as to murmurs.

	Num-ber.	Per cent.		Num-ber.	Per cent.
Murmur:			Transmission—Continued.		
Murmur present.....	321	89.16	Not mentioned.....	165	45.83
Murmur absent.....	1	.27	Character:		
Not mentioned.....	38	10.60	Blowing.....	80	22.22
Heard best at:			Loud.....	54	15.00
Mitral area.....	257	71.38	Soft.....	32	8.88
Pulmonary area.....	14	3.88	Harsh.....	10	2.77
Aortic area.....	36	10.00	Musical.....	2	.55
Tricuspid area.....	1	.27	Short.....	3	.83
Base.....	9	2.50	Crescendo.....	1	.27
Right fourth costal cartilage.....	1	.27	Wheezing.....	1	.27
"Third interspace".....	1	.27	Fleeting.....	1	.27
Ensiform.....	1	.27	Not described.....	195	54.16
Place not mentioned..	40	11.00	Time:		
Transmission:			Systolic.....	269	74.72
Not transmitted.....	13	3.61	Diastolic.....	29	8.05
To axilla.....	157	43.61	Presystolic.....	19	5.27
Along great vessels of neck.....	9	2.50	Double.....	2	.55
Not definitely described.....	16	4.44	Not mentioned.....	67	18.61

As to the area at which the murmur was best heard, it appears that 257, or 71.3 per cent, were best heard over the mitral area; 14, or 3.88 per cent, were best heard over the pulmonary area, and 36, or 10 per cent, were best heard over the aortic area. In 40 cases, or 11 per cent, the place at which the murmur was best heard was not mentioned.

Next, as to the transmission of the murmur, in 13 cases, or 3.6 per cent, the murmur was not transmitted. In 157, or 43.6 per cent, it was transmitted to the axilla. In 9, or 2.5 per cent, it was transmitted to the great vessels of the neck, and in 165, or 45.8 per cent, no mention was made regarding the transmission of murmur.

This table raises some very interesting points regarding these patients. It appears evident that the great majority were surveyed because of a murmur, systolic in time and best heard over the mitral area, and for no other reason that could be ascertained as far as an analysis of their records could show.

While the presence of a cardiac murmur has come to be regarded with more and more complacency in recent years, the fact remains that in probably the majority of cases in the naval service who come to medical survey for a cardiac lesion the presence of a murmur is the most significant finding which serves to call attention to the heart. It is probable that this will continue to be so, and it is probably well that it should be so, as the presence of a cardiac murmur is an indication for a careful examination of the cardio-vascular system. However, we should exercise care and discretion in making the diagnosis of valvular disease under these circumstances. Functional murmurs occur with great frequency, particularly in young individuals, and are usually systolic in time and occur with greatest frequency over the pulmonary area. They may, however, be heard best at the apex, and it is in this type of case that we should exercise self-restraint before making the diagnosis of mitral insufficiency.

A systolic murmur heard best at the apex and unaccompanied by other evidence of valvular disease in itself rarely justifies the diagnosis of mitral insufficiency. There may be instances in which one is justified in diagnosing a valvular lesion with no other evidence, but if one routinely diagnoses mitral insufficiency merely on the presence of a systolic murmur at the apex he will more frequently be wrong than otherwise. In regard to the diagnosis of mitral insufficiency on a murmur alone Thayer says:

"That there are murmurs as to the organic nature of which there can be little or no question in the absence of signs of cardiac enlargement or functional derangement, there is, however, no doubt. In such cases as this, however, the element of personal judgment enters in and it would be really impossible to attempt to lay down a rule

as to when a mitral murmur reaches such a degree of intensity, harshness, or duration as to justify a positive diagnosis of disease of the valves."

Table 12 shows cases classified according to the performance of functional tests. The most significant item in this table is the fact that in 339 or 94 per cent of these patients no mention of a cardiac functional test is made.

While it is true that the ideal cardiac functional test has yet to be devised, it is nevertheless considered good practice to give every heart case some form of functional test in order to verify, if possible, evidence of disability.

Table 13 shows cases classified according to lesions. It appears that in 224 or 62.2 per cent the diagnosis of mitral regurgitation was made and that in 14 or 3.8 per cent the diagnosis of mitral stenosis was made. In 23 or 6.3 per cent of cases the diagnosis of double mitral lesion was made. There were 10 or 2.7 per cent of cases diagnosed as aortic regurgitation and 6 or 1.6 per cent as aortic stenosis. Four or 1.1 per cent were diagnosed as combined aortic regurgitation and stenosis and 17 or 4.7 per cent as combined mitral and aortic disease. In 62 or 17.2 per cent it was impossible to establish the type of lesion from the data on the patient's record.

TABLE 12.—Cases classified according to performance of functional tests.

	Number.	Per cent.
Functional test performed.....	15	4
Functional test not performed.....	6	2
Functional test not mentioned.....	339	94

TABLE 13.—Cases classified according to lesion.

Diagnosis.	Number.	Per cent.
Mitral regurgitation.....	224	62.22
Mitral stenosis.....	14	3.88
Mitral stenosis and regurgitation.....	23	6.38
Aortic regurgitation.....	10	2.77
Aortic stenosis.....	6	1.66
Aortic stenosis and regurgitation.....	4	1.11
Mitral and aortic disease.....	17	4.72
Unknown.....	62	17.26

The relatively greater frequency with which the mitral valve is involved as compared with other valves of the heart as shown by this table agrees quite well with the generally accepted figures on this point for the age groups here chiefly involved. On the other hand, the great preponderance of patients showing evidence

of mitral regurgitation without mitral stenosis is definitely at variance with the findings of most cardiologists of to-day. Of the two types of lesions of the mitral valve stenosis is, as a rule, the more prominent finding. Stenosis and regurgitation are, however, so commonly associated that the diagnosis of "mitral disease" is often made without any attempt to specify more definitely the type of lesion. This diagnosis usually implies the existence of mitral stenosis with some degree of regurgitation.

A review of the foregoing tables is enlightening in several respects.

Figures obtained from the Bureau of Navigation show that the average cost to the Government of recruiting a man with a physical defect who is surveyed and discharged three months later is \$271.49. It is evident that the best interests of the Government would be served if this source of expense could be eliminated and it is incumbent upon medical officers at recruiting stations to exercise the utmost vigilance at all times to prevent enlistments of men with definite cardiac lesions. It is equally essential that medical officers at training stations use the same care in evaluating signs and symptoms to the end that only those recruits in whom can be found certain minimum requirements for a diagnosis of valvular disease, chronic cardiac, should be surveyed with that diagnosis.

It is considered advisable in the first place that the question of etiology be inquired into in each case. Although no etiological factor may be found, if present, it is important. If a definite history of rheumatic fever or chorea can be obtained, the existence of a disabling valvular lesion is rendered more likely. A history of syphilis, especially if the Wassermann reaction is positive, is of great importance in a diagnosis of aortic regurgitation, and may be a deciding factor in the question of line of duty.

Secondly, signs and symptoms of limitation of the field of cardiac reserve should be looked for and recorded. The presence or absence of such findings as dyspnea, edema, and poor response to functional tests should be a factor in determining the disposition of the patient.

Finally, the nature of the lesion or lesions present should be definitely established. This is, as a rule, not particularly difficult, but in order to do it the examination of the pulse, the recording of the blood pressure, both systolic and diastolic, determination of the shape of the heart, and the nature of the heart sounds are often as important as the study of the heart murmurs. The relative importance of the mere presence of a murmur appears to be overrated in the majority of the surveys reviewed. The most serious defect noted in the records was the apparent assumption in many cases that the presence of a systolic murmur at the apex established the

existence of a mitral lesion. An adequate study of the quality of the pulse, the size of the pulse pressure, the nature of the heart sounds, and the evidence of hypertrophy of one or the other of the heart chambers is of the utmost importance. Together with this study a careful inquiry into the timing, localization, and nature of the murmur will usually not only settle the question as to whether the murmur is functional or organic, but will also establish pretty definitely the valve involved. If there are definite enough findings to diagnose the presence of a valvular lesion, the nature of the lesion can usually be established, and if the record offers insufficient data to show which valve is involved one is justified in being skeptical as to the existence of any valvular lesion.

While there can be little question as to the advisability of discharging recruits who show definite evidence of valvular disease, the question is not so simple in the case of the individual with many years of service to his credit, and in the case of an officer coming up for promotion or for his annual physical examination. In the latter type of case it is believed that the immediate discharge from the service of these patients should not always follow as a matter of course. If the lesion is well compensated, is producing no symptoms, is not interfering as far as can be ascertained with the performance of duty, and if it would seem that the individual might easily render years of active service, it is considered inadvisable to immediately anticipate his disability by several years and place him on the retired list.

The foregoing tables and the data derived from their analysis would seem to justify the following conclusions:

(1) The necessity for a most careful and complete physical examination in each case of suspected valvular disease, which should include a careful history tending to bring out some etiologic factor, and a physical examination which should include a study of the pulse, blood pressure, heart sounds, functional response, evidence of hypertrophy, and a careful evaluation of any cardiac murmur.

(2) The result of this history and examination should be incorporated in the patient's record, as it is only by this means that the data so collected can be used to advantage and that the proper recommendations may be made in cases coming to medical survey.

THE COMPLEMENT FIXATION TEST AND OTHER FINDINGS IN MALARIA.¹

By J. H. CHAMBERS, Lieutenant, Medical Corps, United States Navy.

The following résumé of findings in cases of malaria was prompted by the recently reported employment of *Plasmodium vivax* in the

¹ Paper read at the annual meeting of the American Society of Tropical Medicine, San Francisco, Calif., June, 1923. Reprinted from the American Journal of Tropical Medicine.

treatment of general paresis. Wagner-Jauregg (1) noting numerous reports of improvement in paresis resulting from infectious febrile conditions, first proposed *Plasmodium vivax* inoculation for the treatment of paresis in 1887 and later used Koch's tuberculin in doses at first small, but in later cases quite large. Typhoid vaccine in large doses was also employed, and both these gave varying degrees of improvement. In 1917 he inoculated several paretics with *Plasmodium vivax* and obtained a degree of improvement that warranted the continuation of the method. A soldier infected with benign tertian malaria and untreated with quinine served as a donor, and 1 to 4 cubic centimeters of his blood was injected subcutaneously into a group of paretics. They were permitted to have several chills, served as donors for other cases of paresis, and were then given quinine. At the time of his report the strain of *Plasmodium vivax* had been transferred 37 times through 200 paretics. Successful inoculation was also secured by rubbing a few drops of the infected blood upon scarified areas of skin. All the inoculated cases were readily cured of the malaria, the parasite being apparently very susceptible to quinine.

Recently the treatment of paresis by malaria inoculation has been undertaken at St. Elizabeths Hospital. For this work the endeavor was made at the naval hospital, Washington, to secure a patient with benign tertian malaria, without a history of syphilis, willing to give blood, and with a negative Noguchi reaction. The laboratory work on the prospective donors was done in the laboratories of the Naval Medical School, and the fulfilling of the latter requirement showed some interesting reactions and suggested a review of the laboratory records in cases of malaria.

Opinions differ widely as to the effect of malaria on the Wassermann reaction. In the numerous reports on the subject the authors rarely give an adequate description of the technique employed in their work, so that it seems better to refer to the test as a complement fixation test rather than a Wassermann, as very few employed the Wassermann technique. Reports by De Jong (2) (3), Thompson (4), St. John (5), and Johnson (6), all stress the importance of basing conclusions only on tests performed according to well-established technique. St. John used cholesterinized antigens, with modified Noguchi technique. Johnson employed the standard Wassermann method on all sera, with parallel tests in other laboratories by at least one of three other methods in each case, and obtained complete agreement in only 57 per cent of the tests.

The occurrence of a positive complement fixation test for syphilis in cases of malaria has been reported by Craig (7), Sutherland (8), De Jong, St. John, and Hehewerth (9). Craig in a review of 2,643

Wassermann reactions considered only 5 due to malaria. Wassermann and Lange (10) feel that a positive reaction in anyone who has come from a malaria country is not acceptable evidence of syphilis unless the test remains positive after quinine therapy. They refer to the work of Meyer and Bonfiglio in Italy, who obtained positive tests in 80 per cent of their cases of malaria. Schoo (11) obtained 22 positive reactions in 28 cases of malaria, Zschuki (12) reported 14 of 27 positive, De Haan (13) 63 of 153 positive and felt that syphilis was excluded in 29 of the positive cases. Meyerstein (14) does not give the number of cases tested but reports from 70 to 80 per cent positive, with the strongest reaction in blood taken during the febrile stage, a positive reaction 10 days later being very rare and all reactions negative after quinine therapy.

Hehewerth tested heated and unheated serum from Europeans and from natives of Java. With heated serum he obtained no positive reactions on three Europeans (two of them having treated syphilis), while all three were positive with unheated serum. Unheated serum among natives gave many more positive tests than heated and the positive reactions persisted for some time, many over six months, but the inhibition of hemolysis usually became weaker. They conclude that in a malaria country a positive Wassermann can not be considered evidence of syphilis in the absence of positive clinical evidence of syphilis.

Opposed to these reports of positive reactions due to malaria there is a smaller number of reports, but included in this group are some noteworthy series. Thompson (4), using the Wassermann technique in a well-established laboratory, tested the serum of 130 individuals, with negative tests in 122. Fifty-two of the patients had parasites in the blood at the time of the test, and blood was taken at varying times for different groups—the first group during the stage of chill and successive groups ranging as high as several weeks after the last observed chill. One such series was made on patients receiving quinine and another on patients receiving no quinine. The serum from 70 patients not showing parasites at the time of the test, but with a history of malaria, was tested with 70 negative results. Eight cases of malaria giving a positive reaction were referred to C. H. Mills, and he pronounced all of them syphilitic after thorough examination. Thompson draws conclusions that seem entirely justified by his results, namely: (1) The Wassermann reaction conducted according to a recognized standard method does not give a positive reaction in malaria at any stage of the disease; (2) if a positive Wassermann reaction is obtained in a case of malaria, it is either due to undiagnosed syphilis or to a faulty technique.

Johnson (6) attributes the varied opinion as to the occurrence of positive tests in malaria as due principally to the varieties of complement fixation test used. He concludes: (1) That the blood in active malaria does not give a positive Wassermann; (2) syphilis should not, however, be diagnosed on the occurrence of a positive reaction on blood taken during the febrile stage of malaria; (3) if the test is again positive on blood taken later it furnishes the usual accepted evidence of syphilis.

Thompson, De Jong, and Johnson, all emphasize the point that there should be no clinical confusion from the occurrence of a positive test on blood taken during the febrile stage of malaria, as that is not the time to elect for the serum diagnosis of syphilis. Clinically the test as a diagnostic measure would not be performed at that time, and hence there is no lessening of its value as an indication of syphilis in malaria patients.

In reviewing the laboratory records of the Naval Medical School it was found that since January, 1917, there were recorded 68 cases in which the presence of malarial parasites were demonstrated in the blood. Of these 57 were benign tertian and 11 estive-autumnal. The complement fixation test employed here is the modification of Noguchi, using an acetone insoluble antigen and a cholesterinized antigen with heated serum. The technique is well established and on several occasions has given results practically identical with tests conducted in other laboratories on samples of the same serum separated for comparative tests. In the 68 malaria patients a complement fixation test was done on the serum of 34. All of these were negative with both antigens except four. Two of the four cases had a definite history of syphilis, and a record of treatment with arsenicals and mercury. When their blood was taken, they were in the febrile stage of a paroxysm with very numerous benign tertian parasites in the peripheral circulation. The syphilitic patients showed only partial inhibition (acetone insoluble antigen 1+ and 2+, cholesterinized antigen 2+ and 3+, respectively) comparable to the readings in the same series of tests, on malaria free patients under syphilitic treatment. Both patients after receiving quinine by mouth for from five to seven days, gave a negative complement fixation test and showed no parasites in the peripheral circulation on prolonged and repeated search. More of the patients in the group with negative Noguchi reactions probably had treated syphilis, but as their hospital records are not available, an exact statement can only be made in regard to three.

The third patient had blood taken 24 and 48 hours after a chill, the second specimen during the cold stage of the next paroxysm. This serum was held 48 and 24 hours and each specimen gave a par-

tial inhibition (1+ acetone insoluble, 2+ eholesterinized antigen). The same serum was kept in a refrigerator for four days more, and tests on both were negative, which does not confirm the opinion of Thompson that heated serum tends to become positive when kept. This patient, after receiving quinine for five days, gave a negative complement fixation test on fresh-heated serum. He was at that time free of parasites. A careful inquiry into his history and careful physical examination by competent clinicians revealed no evidence of syphilis. Several later tests on this patient were negative. It is believed that this reaction was not due to faulty technique, as it is extremely unlikely that two mistakes would be made in one run of tests, nor, if made, that they would occur in tubes in widely separated positions in the rack. The same series of tests carried clean-cut positives and negatives in addition to the controls, and tests on a group of syphilitic patients at varying stages of intensive hospital treatment and showing the degree of inhibition of hemolysis expected at their respective treatment stages.

Another patient, with a history of initial malaria infection in 1921, has had numerous recurrences, with a record of four negative Noguchi reactions at various naval laboratories. In all these laboratories the complement fixation technique is the same as that employed in this laboratory, and their antigen and amboceptor were produced here. One of the negative tests was performed here on blood taken a few hours after a chill in a previous attack. On blood taken within 30 minutes of the onset of a chill, showing very numerous parasites of benign tertian malaria, a 3+ reaction with acetone insoluble antigen and complete inhibition (4+) with eholesterinized, was the result. Blood taken 22 hours after the paroxysm gave a 2+ and 3+ reading. Both serums were kept in the refrigerator for four days and tested again with negative reactions. This patient also gave no evidence of syphilis on careful examination. Serum taken after five days of quinine gave a 1+ and 3+ reaction.

So excluding two known syphilitics with malaria, there have been only two positive complement fixation tests in 32 patients. As most of the patients had more than one test the actual number of Noguchi tests were approximately 55.

One interesting clinical observation was that at least two of the patients having malaria, had recently completed a course of arsenical treatment for syphilis, without eradication of the *Plasmodium vivax*. This was evident from the recurrence of symptoms of malaria at a season and location precluding new infection.

In reviewing the laboratory records, there were recorded 38 complete blood counts made at the time of finding the malaria parasites.

A few of the counts showed very marked increase in the percentage of large mononuclear cells, but the average of the count was as follows:

Erythrocytes	4,759,000
Leukocytes	7,870
Polymorphonuclears	per cent. 60.8
Lymphocytes	do 28.4
Large mononuclears	do 9.2
Eosinophiles	do 1.2
Basophiles	do 0.3

There is possibly a slight increase in the percentage of large mononuclears but the count tends to confirm the recent report of Swan (15) in which he considered a large mononuclear increase as not constant during the active stage of malaria.

Our records of complement fixation tests seemed to confirm the opinion that a test conducted according to a standardized technique on the serum of malaria patients will be negative in the absence of syphilis. However the last two patients, appearing while this paper was in preparation, and showing at least partial inhibition of hemolysis in more than one portion of serum necessitates the conclusion that occasionally serum taken during active schizogony may yield a positive Noguchi test, but that it is very uncommon. In view of the two positives in cases of treated syphilis, both with negative Noguchi's test prior to the onset of malaria, we feel that we have additional evidence that a positive Noguchi in malaria is due to syphilis in the great majority of cases. Of course the impropriety of doing a Noguchi test on a patient during his active malaria as a diagnostic test should rule out any improper assumption of syphilis as a result of the very rare positive test.

CONCLUSIONS.

1. Large mononuclears are slightly if at all increased in the active stage of malaria.
2. Careful technique will eliminate a number of the positive complement fixation tests in malaria.
3. Rarely there is a partial inhibition of hemolysis in serum taken during active schizogony.
4. Because of this rare positive, no attempt to diagnose syphilis by a complement fixation test in a malaria patient should be made till after the peripheral circulation has been freed of a demonstrable parasites by quinine.
5. Patients with treated syphilis and a negative Noguchi may show a weakly positive reaction if their serum is taken during a malarial paroxysm, but the majority will not.

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ILLUMINATION OF DENTAL OFFICES ASHORE AND AFLOAT.

By H. E. HARVEY, Lieutenant Commander, Dental Corps, United States Navy.

The very unfavorable conditions of lighting under which dental work is expected to be performed aboard ship has caused the writer to give considerable thought and attention to the subject. When it is recalled that portholes on shipboard may be circles 11 inches in diameter, cut in the side of the ship, and that it is through one of these, or under exceptionally favorable circumstances two of them, that daylight is obtained, some idea may be had of the limited amount of natural illumination available. Electric lights, of course, are available and it is to the disposition of these that attention was directed.

Part of the service of naval dental officers is on shore, and lighting conditions in the offices ashore are found to be without uniformity and in many cases very unsatisfactory. The problem, therefore, was to formulate if possible an arrangement of light which could be used with equal advantage afloat or ashore.

In 1917 an inspection of some of the better class dental offices in New York and Brooklyn, as well as inquiries at dealers both dental and general, elicited the fact that, with one exception, but little attention had been given the subject of proper illumination for dental work.

On shipboard about that time all living quarters were painted with white enamel with the idea apparently of making the most of the light rays present through reflection. This has happily been

discontinued as the effect day in and day out was to produce a glare which to say the least was not restful to the eyes. Recommendations of certain medical officers have been followed and interiors are now finished in flat paint with a slight tint, and this, combined with shaded light and indirect illumination, has proven very satisfactory.

We are told that the light intensity outdoors at noon on a clear day of June will average about 9,600 foot-candles and in December under the same conditions about 4,300 foot-candles. In contrast to this the illumination or average light of our workshops at night will seldom exceed 5 or 6 foot-candles. By some it is believed that an office can be too well lighted, with injurious results, but apparently the truth is that harm seldom or ever comes from too much illumination. Glare, not light, in practically all cases is the damaging factor. As light increases the ciliary muscles of the eye contract, lessening the aperture of the pupil. If, however, the light is caused by glare a much greater contraction occurs than is justified by the actual intensity of the illumination present. This explains why, when fine work is attempted in the presence of glare, a further accommodation is necessary which is not consistent with the amount of general illumination. Under such circumstances removal of the vision from the work causes a contraction of the ciliary muscles, which are again relaxed as work is resumed, and this seesaw back and forth is thought to be responsible to a large degree for eye-strain. In other words, fatigue here, as elsewhere, is caused by the presence of poisonous waste products which are produced faster than they can be physiologically removed from the muscles. Corpuscular disintegration of the blood is said to be responsible for the pain which persists in muscles for several days after unusual exercise; logically the same condition may be present in the intrinsic eye muscles, with the added factor that the feeling of discomfort is usually not definitely localized.

As will be seen above, the human eye is perfectly comfortable outdoors with a light intensity more than a thousand times greater than that generally used by people in the evening when they read or work at home or in the office. Daylight is the easiest of all light on the eyes, and the reason is that day light reaches us in a high state of diffusion. In this connection it has been suggested that window roller shades should be of translucent material such as oiled *écru* Holland, which, while permitting access of light, will diffuse and soften the rays of the sun. Opaque shades will diminish illumination without diffusion.

Efforts have been made to secure lighting results wherein shadows are eliminated. This we are informed is a mistake, for it is the shadow which produces the relief, causing contrasts and the object

to stand out. Stereoscopic work, of interest to dentists in radiography, it will be recalled, is one of definite shadows.

Lighting engineers have found that it is injurious to have strong light directed to the cutting point of tools and to the top of workbenches, while all around the operative a semidarkness prevails. Excessive lights on spots causes eyestrain and poor vision of surrounding areas. Such a lighting arrangement, as the eye shifts from light to dark and vice versa, causes an undue pupillary reflex which is conducive to strain if continued over a period of time. In a large percentage of cases in which glasses are worn the necessity for them has arisen from the kind of light under which work has been done.

Our traditional dental textbooks, as recalled, recommend a north light. This recommendation, however, in the opinion of the writer is open to discussion and should not be accepted on historical grounds, particularly during the winter months of early darkness. A ship at anchor swings with the tide, and the reason for disputing the advisability of using north light is that experience has demonstrated much less fatigue and eyestrain when working on the side of the ship which swung to the sun. The other side of the ship enjoys a more even light, which is claimed as the merit for the north light, but it does not seem to be of sufficient intensity. This is especially noticeable toward the close of the day when fatigue is present.

Various types of lights, projectors, and lamps have been experimented with and indirect illumination for fine work is considered not to be economical from the standpoint of efficiency. A competent authority stated that it was his opinion that to secure illumination of a cavity with a red lining such as the mouth, ten times the intensity of light is needed to produce that equal to the surface surrounding the orifice. Such a disposition and diffusion of light would seem to answer the requirements; that is, that the interior of the mouth be illuminated with a light of sufficient intensity to make the illumination approximately equal to that present on the orifice and in the well-lighted room in general. In other words, no undue pupillary reflex should be induced when directing the vision in the mouth and without. A dental-operating light, such as the Rhein type, wherein a cluster of lights is suspended in front and to the left of the patient, or one of the Bosworth type, a single lamp of brilliant intensity, would seem to be deficient in that general illumination only is present, the end result being that the operator is endeavoring to work in a field considerably darker than the surface about the orifice and the surrounding room, manifestly an improper proceeding. The objection to this type also exists, viz, that a constant glare is present both to the eyes of the patient and operator. As the latter

removes his vision from the dark hole it encounters the fourfold intensity of the light, thus establishing a muscle reflex with every glance from the field of operation. In addition to this, as the side of the face of the operator is toward the light while working, an involuntary accommodation of the ciliary muscles to this side light takes place, and, further, if glasses are worn the reflection of the light on the lens makes an additional accommodation. Incidentally, it is a fault of many operators not to look directly into the mouth as they would at a book, but from a side or elevated or depressed angle. We have, then, to summarize a possibility of the following conflicting factors when dental work is attempted under general artificial illumination or a combination of daylight and general artificial illumination.

First. Working in a field darker than surrounding objects.

Second. With a bright light or cluster of lights in the direct line of vision as the eye is raised from the work.

Third. An off accommodation of the pupillary muscles as the light enters the eye from the side.

Fourth. If glasses are worn, the glare reflected from the light on the lenses as the head is turned away from its source. This may not be perceptible to the senses, but is a factor to be reckoned.

Fifth. Directing line of vision from an angle which strains the extrinsic muscles of the eye. The spot light or reflector which projects a beam of light into the mouth without coming into the line of vision of the patient or operator is thus seen to be preferable in most respects. However, the illumination of the room and surrounding objects should be sufficient to prevent undue contrast between the intensity of light within and without the mouth.

The small so-called dental lamp with the light bulb in the mouth has its defect, as, while it can be dimmed to prevent too great an amount of light, it always presents a comparatively strong point of light in a dark field, and it is necessary to work past this point to perform dental work. In other words, the eyes are involuntarily accommodated to the position and amount of light present and then the vision is voluntarily directed past the light, necessitating a further accommodation. Here also undue pupillary reflex is inevitable as work progresses and the eyes are removed from the field of operation.

As previously noted, one exception was found to the absence of special or satisfactory lighting arrangements in New York or Brooklyn offices. This arrangement, with an addition by the writer, proved so satisfactory on the hospital ship *Comfort* that it is now embodied in standard specifications and plans for dental offices on battleships under construction. The center of the seat of the dental

chair is used as a guide, and directly over this, at a height of about 7 feet, is placed one 200-watt frosted lamp, and two others of like size are placed at the same height on the corners of an equilateral triangle of 4 feet, with the first light as the apex and the base of the triangle parallel to and in front of the chair. These should have individual switches. Such an arrangement has been found to give a splendid general illumination and diffusion of light without being directly in the line of vision of the operator; additional ceiling lights are used in conformity with the size of the room or compartment. The operator, as he stands in position by the patient and turns his head a little to the right, then faces the light to the front and left of the patient. To dim the direct rays from this light a disk of heavy white paint, perhaps an inch in diameter, is painted on the globe or shade. The size and position of the disk should be sufficient to prevent the rays from striking the vision as the operator glances in that direction or moves about in the vicinity of the cabinet. However, it should not be large enough to cut any of the rays from the face of the patient.

As has been remarked, however, general illumination is not sufficient to prevent eye strain, and to augment the above a bracket light of French origin has been purchased by the naval medical supply depot which will give a spot-light effect in the mouth. This light is of substantial construction, can be placed far enough away from patient and operator to obviate heat, can be focused to compensate for distance, and is of such construction that it will not permit of the light rays entering the operator's field of vision except as they are projected into the mouth and immediate vicinity.

To conclude, it would seem that good general illumination, without glare, is necessary ashore and afloat, and in addition a spot light of sufficient intensity to adequately illuminate the interior of the mouth and equalize illumination.

THE OPEN OPERATION FOR THE EXTRACTION OF TEETH.

By S. H. REED, Lieutenant Commander, Dental Corps, United States Navy.

The question of whether or not the so-called surgical extraction of teeth as carried on at the Mayo clinic should be adopted as a standard technique in the majority of cases where extraction is indicated has occasioned a great deal of discussion recently, a notable example of which is the article by Dr. Edmund Kells, published in a recent issue of the Dental Cosmos and a criticism of this article appearing in the July issue of the same magazine and written by Dr. Leon Harris of New York.

The opposing views held by these two well-known dental authorities represent the general attitude of the dental profession in respect to the technique practiced by Dr. Boyd Gardner and his assistant Doctor Austin, at the Mayo clinic, and reflect to a considerable extent the views of the majority of dental operators who have not been able to form their opinions by actual observations, and who have, therefore, been obliged to arrive at conclusions based on the published observations of others. As any departure from the established order of things is viewed with distrust by conservative and successful operators, and as the same departure is ordinarily hailed with much acclaim by those members of the dental profession who pride themselves as being in the vanguard of progress regardless of where it leads them, it is then not surprising that older, more conservative and successful operators, have occasionally been called upon to rectify the mistakes occasioned by the zeal of too enthusiastic young dental surgeons, whose efforts in behalf of progress have proved more of a hindrance than a help.

Likewise, it is to be expected that advocates of the more radical methods who have demonstrated the value of their technique, at least to their own satisfaction, have not a great deal of patience with those older and more conservative operators who seem to be unwilling to immediately acknowledge the value of the more radical procedure.

It is not the purpose of this article to advocate the surgical extraction of teeth as practiced at the Mayo clinic and elsewhere, nor to submit arguments against this procedure, but to review briefly the gross technique now pursued in what Doctor Gardner prefers to call the open operation for the removal of teeth, the reasons why the open operation is preferred, and the results attained, with special reference to whether or not such surgical procedure is indicated in the naval service.

The technique now employed at the Mayo clinic has been modified somewhat from that carried out when surgical extraction was first brought to the attention of the profession, inasmuch as less process is now removed previous to extraction than was formerly the case. Much of the criticism of Doctor Gardner's technique has been directed at that which has been more or less generally understood to be the radical excision of the entire bucco-alveolar tissue covering the roots of teeth to be removed down to their apices before the removal of these teeth is attempted, thus affording easy access to any granuloma or infected area present and guaranteeing its removal in entirety. This in effect is doubtless still considered by many dental operators to be the technique now pursued, coupled also with the idea that the operation is further complicated by extensive and

thorough curettement and supplemented by a series of postoperative treatments requiring careful attention. Such procedure is, of course, rarely employed.

In a week's observation of the technique of the open operation for extraction it was noted that only such amount of the buccal process was chiseled away in each case as would permit of the removal of the tooth to be extracted without possibility of fracture of the process supporting adjacent teeth or injury of the membrane surrounding them. This, in fact, is the chief reason for employing the chisel, and its use for this purpose would seem rational and logically indicated as a precautionary measure accompanying careful conscientious practice.

Doctor Gardner admits that most extractions made without retracting the gum tissue and employing the chisel are satisfactory in so far as but little if any harm is done adjacent teeth, but it is the small but appreciable percentage where damage is done sometimes to a considerable degree that his technique is designed to prevent; therefore, in reply to a question as to whether or not he would advise the open operation for the removal of all teeth, whether or not the X ray showed apical involvement, exostosis, or other complications, he desired to record himself as being of the belief that the technique as carried out at the Mayo clinic was always indicated for precautionary reasons.

In view of the fact that prevention is the keynote of modern dental practice, it seems logical to assume that precautionary measures on the part of the operator are preventive measures and as such are entitled to consideration.

Another matter which would seem to favor the open operation is that the retraction of a flap of gum tissue facilitates the trimming of the process to remove irregularities and sharp protuberances of supporting process often left by the removal of teeth and which impinge on the gum tissue and cause discomfort and pain long after the wound has healed. The clear view obtained by the retraction of the flap enables the operator to remove just the right amount of process by bone cutting forceps or chisels, so that when the gum is sutured to place a soft cushion is provided for the reception of dentures, saddles, or other restorations. This can best be appreciated by those operators who have had occasion to retract the tissues and trim the processes of edentulous patients months after the teeth have been extracted in order that dentures might be made that can be worn without acute discomfort and pain.

All extractions at the Mayo clinic are made while the patient is recumbent upon an operating table. This seems to impress the casual observer as scenery or stage setting done for its effect on the patient and the profession. It has the effect of making a minor

operation seem like a major one. This particularly as many members of the dental profession visit the dental clinic expecting to find something spectacular and seize upon this feature as justification for their preconceived ideas.

In response to the question "Why use an operating table?" Doctor Gardner said that it was used for the psychological effect upon the patient; that it provided a routine of asepsis not ordinarily obtainable at the dental chair without additional trouble; the patient was in a position of rest; the patient's hands were at his side, covered with a sheet and out of the way; the head, the hair, and particularly the patient's eyes were covered. The field of operation was in perfect view and the operating position excellent, all reasons being particularly pertinent to the cases treated.

Concerning curettement after removal of teeth having apical areas of infection, it was noted during the period of observation mentioned that such curettement was done only for the removal of all traces of existing granulomata and as gently as possible.

The mallet and chisels used in removing the process previous to extraction are the same as formerly employed and are described in detail in an article by Doctor Gardner published in the *International Journal of Orthodontia and Oral Surgery* in March, 1921.

Concerning the advisability of adopting this technique of extraction as the standard for general use in the Navy, it would seem to be advisable but impracticable for reasons which will be readily understood by operators in the Navy Dental Corps. If, as Doctor Gardner admits, practically 90 per cent of extractions performed without employing the flap and chisel method are successful, it would seem impracticable, in view of the small number of dental officers provided to care for the dental needs of the Navy personnel, to adopt a method requiring considerable more time and assistance in addition to supplementary equipment in order to attain a higher percentage of success, particularly as the introduction of this method without special instruction in technique would at first probably result in more harm than good. Were extractions the only operations performed by the members of the Dental Corps afloat and ashore, or were facilities as would enable dental officers to maintain separate operating rooms with proper assistants to lessen the loss of time which this technique would occasion, it might be advantageous to adopt it, but under existing conditions the open operation would seem to be only indicated at the shore hospitals of the Navy in cases where clinical and radiographic findings are such as to render the ordinary methods unsatisfactory or dangerous.

In connection with the matter of adopting the Mayo technique for use at naval hospitals, there is one feature of the Mayo routine which should be of value in the treatment of patients admitted with diag-

nosis undetermined or in cases of suspected focal infection, and which might well be adopted with benefit to all concerned. This is the system of recording dental, clinical, and X-ray findings.

This system groups the teeth of patients examined into two main groups. Group I are those teeth which the examination has shown to present sufficient local evidence to warrant removal.

Under Group II are listed all suspected teeth, nonvital, pyorrhetic, and otherwise.

Group I teeth are extracted without consultation with other operators. Group II teeth are referred to the physician having charge of the case and are removed only on his request.

It is assumed that all findings in each case admitted for treatment for other than purely dental care are in the hands of the physician in charge, and his is the task to determine what is indicated in the way of surgical interference in order to effect a cure.

Thus it often happens that when the extraction of all teeth under Group I fails to improve the general condition of the patient as much as it should, and other possible foci of infection have been also eliminated, subsequent removal of Group II teeth have immediately caused marked improvement in the patient's health and have often effected a positive cure.

A copy of part of the dental history sheet is appended :

Group I (sufficient local evidence to warrant removal) :

Periapical infection, Nos. ———.

Pyorrhea, Nos. ———.

Impacted or unerupted, Nos. ———.

Group II (to be removed in addition to Group I, if every possible focus is to be eliminated) :

Questionable teeth, Nos. ———.

Impacted or unerupted, Nos. ———.

Degree dental infection :

Periapical infection—O, I, II, III, IV.

Pyorrhea—O, II, III, IV.

Operate here: Yes ———. No ———.

Remarks ———.

D. D. S.

Approved: Group I. Group II.

(Physician to indicate in the affirmative by underlining.)

———, M. D.

Date ———, 192—.

DEEP X-RAY THERAPY.

By G. U. PILLMORE, Lieutenant, Medical Corps, United States Navy.

It is believed that the greatest recent contribution to the armamentarium against cancer is deep X-ray therapy. Reports of successes from the large clinics using this method are of such impor-

tance that it is incumbent upon us as military surgeons to know some of the details of the method.

Surgeons have slowly accepted preoperative and postoperative radiation of certain types of malignancy, but gradually biologic effects from use of the X rays, based upon scientific principles, have gained foundation sufficient to establish the X ray as a part of the equipment necessary to fight malignancy. To-day the X-ray treatment of malignancy does not occupy the court of last resort and it will never supplant surgery. There will never be strife between the surgeon and radiologist as to whether or not the former or latter shall handle cancer individually without the assistance of each other. The radiologist shall remain the consultant, and with the recent new knowledge and instrument at his disposal he will aid in the fight. Deep therapy will never decrease the necessity for early diagnosis or proper operative technique, but it has and will continue to help when both have been faulty.

Cases of inoperable cancer clearing up entirely under deep X-ray therapy are frequently reported. With numerous successes to support them, investigators are continuing rapidly to increase the facilities and accuracy of the treatment and to decrease its dangers. In our large clinics in this country the deep-therapy machines are running steadily from morning until night, with intermissions only for change of patients. Deep therapy has come to stay. Of its future possibilities and of its dangers all is not known. From month to month new knowledge is gained and new benefits derived.

It is with a view to giving the naval surgeon a general idea of the factors involved in deep therapy that the following synopsis is offered in a nontechnical manner. The subject is highly specialized in the hands of the engineer, the physicist, and the biologist, and we of the naval service must necessarily leave investigations with them.

In our naval hospitals the usual standard X-ray equipment utilizes for diagnostic purposes voltages of from 40,000 to 70,000 and up to about 125,000 for treatment work. The new deep therapy equipment utilizes a voltage up to 300,000 or more, which is twice as much as heretofore used. This increase of voltage has made X rays of shorter wave length. The general public to-day has an intimate knowledge of wave lengths as learned from operating and studying wireless receiving sets. X rays also have wave lengths along the same physical principle. The difference in wave length between those sent by wireless and those cast off from the X-ray tube is considerable. In the former the waves are usually several meters long, whereas X rays have a wave length of several billionths of a centimeter. Since this property of wave length was discovered in the

X ray the terms "soft tube" and "hard tube" have been discarded. We now speak of X rays having short wave length and long wave length.

In order that the tube should stand up under such a tremendous voltage as 300,000, a new type had to be designed. Perhaps the best tube for the purpose is one designed by Coolidge. "The bulb is 8 inches in diameter and it has a length of 32 inches over all. As in the 'Universal' type of tube, the anode is of solid tungsten, with a molybdenum stem, and is supported from almost the extreme end of the anode arm. The distance between the cathode and anode has been increased from that of the 'Universal' type of tube (1 inch) to 2 inches, to reduce the electrostatic pull on the filament and to decrease the tendency for the liberation of electrons from the edges of the focusing device."

According to Duane, "Researches in physical science have shown that wireless waves, light, X rays, and the gamma rays consist essentially of the same kind of waves; further, that they differ from each other only in the length of the waves. Consequently, the high-voltage machine produces rays closely resembling the gamma rays produced by radium. An additional fact about these short rays is that they often have the power of more penetration than radium gamma rays. This was an advancement, for with the deep penetration of these rays came the ability to treat deep-seated lesions with X rays with more success than heretofore obtained. Hence the term 'deep X-ray therapy.'"

The problem on the face of it looked simple to the average radiologist. It was believed at first that all that was necessary was to set a machine at a certain voltage, place the tube at a fixed distance, use a certain time factor, filter out sufficient of the long X rays produced at the same time as the short ones to insure against damage to the skin and all would be well. Consequently, charts were made (after treating certain types of malignancy with good results) based on the principle, for example, of a skin erythema dose as 100 per cent; ovary castration dose 34 per cent; sarcoma dose from 60 to 70 per cent; carcinoma dose from 100 to 110 per cent; recto-sigmoid dose 135 per cent; and muscle dose 180 per cent.

Accidents happened as a result and the method was condemned in some clinics in this country. Soon, however, it was learned that "different X-ray plants produce X rays of different intensities and effective wave lengths even though they may be running at the same voltage as estimated by a sphere gap and with the same current through the tube." This meant that the input to a tube was not the proper control. A method had to be established whereby the X ray itself had to be measured in order to get reliable information of

dosage. The old pastilles and photographic measurements were of no use for the purpose. Long before the short wave lengths were used it had been proved satisfactorily that there was as much as 50 per cent of discrepancy in their use. Immediately the physicists took up the problem for intensive investigation in an endeavor to obtain shorter wave lengths.

With the physicists the biologists have worked hand in hand in the few centers where research work is going on. Where the physicists have shown as much as a 40 per cent variation in different machines using the same voltage, filter, distance, current, and time, the biologists have shown variations of physiological changes; but the biologist can only draw conclusions from the reaction on the tissue when the physical laws of irradiation and the exact knowledge of the distribution of rays within the tissues have been accurately ascertained.

Many of the physical properties of the X ray were studied and understood years ago. Superficial treatment of lesions on the skin surface was successful before Senn, of Chicago, in 1905, conceived the idea of treating lesions in the subcutaneous tissues.

Ideas have changed rapidly, however, in regard to many characteristics of the ray. A short time ago it was generally an accepted principle that the tube had to be as close to the body as possible. Special tube holders were devised for this purpose, but now we know that the "greater the distance between the tube focus and the skin overlying the part under treatment the larger the proportion of the Röntgen rays incident upon the skin to reach a given depth, say 10 centimeters. The only limit on the remoteness of the tube target is that placed on time considerations, for with other factors constant the time required for a single seance increases in proportion to the square of the distance." Next came the knowledge of the biologic effects of secondary radiations. The portal of entry was increased in size to increase the proportion of incident radiation. It was an important discovery to realize the importance of secondary radiation.

According to Barkla, there are three kinds of secondary radiation. Case summarizes them as follows: (a) The secondary characteristic or florescent ray, which is solely and singly peculiar for the substance in which it is excited; (b) the secondary beta radiation, which is a corpuscular radiation, easily absorbed in a few millimeters of tissue; (c) the most important of the secondary rays from the standpoint of deep dosage, termed the scattered radiation, which possesses the same wave length and other physical properties as the primary exciting ray. Since it is analogous to the scattering of light rays in a relatively opaque medium, it is evident that the larger the

field of incidence the greater the effect of scattered radiation. It was known 20 years ago that there was such a thing as secondary radiation, but only in the past few years has its valuation been appreciated in therapy. When large portals of entry are used with the short wave-length treatment it was proved that the tissues beneath the skin may receive more than 50 per cent of that delivered at the skin by reason of secondary radiation. If the wave length is short, a larger amount of secondary radiation will reach the deep-seated tumor. If the wave length is long, there is more tendency for the tissues to absorb the ray.

One kind of ray can not be produced from a tube target. There is always a mixture of rays. There are long waves produced at the same time as the short ones from the high-voltage tubes. By introducing various filters in the path of these rays the effect is to decrease the intensity of the longer waves to a greater extent than that of the short waves. "The filter does not change the value of the minimum wave length. It does, however, reduce the value of the average, or what we may call the effective wave length of the beam."

The method of measuring the wave length of X rays is described as follows by Duane, who has done more of this work than any other man in this country. "A beam of X rays coming from a target passes through a small hole in a brick wall and then through a narrow slit between lead blocks. The X-ray tube and the generating plant to be in one room and the spectrometer in another room. The wall between the rooms gives good protection to the spectrometer and the operators against stray radiation from the tube. When high voltages are used, and, therefore, penetrating radiation, it is advisable to add a considerable thickness of lead to increase the protection. The X rays after coming through the lead slit pass through a small crystal mounted on a spectrometer table. The spectrometer table can be turned through any desired angle, and the position of the crystal determined by reading the spectrometer scales. Part of the X-ray beam is reflected by the atoms in the crystal. X rays of certain wave lengths only are reflected at a given angle. By measuring this angle the wave length can be calculated."

Duane has shown that, given a tube with a fixed current, filtration, focal distance, and maximum voltage as determined by sphere gap measurements, the amount of X radiation and the average wave length will differ from each other if first a constant voltage and then alternating voltage is applied. The constant voltage will give shorter wave lengths and more intensity of X radiation.

The next important consideration, after realizing what short wave length and long wave length X radiation will do, is to have a

knowledge of how to force the necessary short waves into the tissues. In the effort to force a sufficient amount of X rays into the deep tissues, a large quantity of X radiation will be absorbed in the superficial tissues unless the long waves causing the greatest amount of absorption are filtered out. So, for this purpose, various thicknesses of copper, zinc, aluminum, etc., are used. If this were not done, serious X-radiation burns would result. Duane has shown that by using short waves a larger amount of radiation will pass through 1 millimeter of copper than 12 millimeters of aluminum, whereas, with long waves more radiation will pass through 12 millimeters of aluminum than 1 millimeter of copper. From this we conclude that to produce a beam of short wave length copper is a better filter than aluminum.

Elsewhere I have mentioned the importance of the intensity of X radiation and the effective wave lengths. Around these factors hinges the all-important item of dosage. How much shall we give and how much are we giving? At present I believe that it is quite safe to say that no one knows. If we did there would be no more necessity for further investigations except by the biologist. Dessauer's charts were not suitable for American transformers, so Glasser has attempted to remeasure them. He used the ionto-quantimeter of Kroenig and Friedrich. The conclusions of Kroenig and Friedrich reached by the instrument they constructed have been questioned and many errors proven. Dessauer, who made the treatment charts, has reported data which Weatherwax and Leddy, working under the same conditions, will not confirm. Some authorities swear by Duane's ionization chamber with its fallacies, and others by Kroenig's and Friedrich's ionization chamber and its fallacies. In other words, measurement of the intensity of X radiation is not settled.

Of the two ionization instruments mentioned, and they are the best at present obtainable, probably Duane's is the most reliable. Elsewhere, a description was given of the spectrometer for measuring wave lengths. The ionization chamber measures, as nearly as possible, the intensity of X radiation, but at present it measures only relative or practical dosage.

Duane's ionization chamber consists of a "number of very thin aluminum plates alternately joined together. Hard-rubber insulation separates the two sets of plates from each other. Wires running through two flexible insulation cables join the ionization chamber with a battery and galvanometer. A flexible metallic shield joined directly to the earth covers the cables. The chamber is also shielded by a thin plate of aluminum. This shielding is important for purposes of electrostatic protection. When the ionization chamber lies

in a beam, the rays make the gas between the sets of plates a conductor of electricity, and a current from a battery flows around the circuit through the galvanometer. This current depends upon the intensity of the X-ray beam," and Duane takes the magnitude of the current as a measure of that intensity. The chamber is calibrated by means of a standard instrument, in which the rays pass through a large volume of air without striking any of the electrodes inside of the chamber.

It would appear that the above instrument from the ordinary standpoint of physical measurements is correct in detail, but unfortunately the X-ray beam has not yet yielded all its secrets.

There is no unit standardization between physicists, a factor which adds to the confusion of all the highly specialized physics involved. This is a drawback, in that cooperation is seldom possible. The investigators realize this and all plead for standardization, but different ideas exist as to what should be a standard, because the physical problem presents itself slightly different to each of the different research workers.

The biological difficulties present barriers even greater than the physical. If we can not master the remedy or physical difficulties, then we can not master the biologic effect. So, the two must go hand in hand.

Holznecht says: "The conceptions—destructive dose, paralyzing dose, carcinoma dose, stimulating dose, ovarian dose, etc., have all been found wanting for practical purposes. Evidently, under the influence of a mechanistic natural philosophy, there has taken place what might be called a standardization of pathology which years ago met with scant favor. They all are of significance as working hypotheses from which the investigation proceeds and advances. It is not we, but the particular form of tumor, which determines whether our treatment will be successful or not. For the present, in order to simplify our task, the manifold prescriptions of dosage must first be formed into several groups." These groups he says should comprise those tumors that require an extremely large quantity (carcinomata); the sarcomas and certain other affections requiring a considerable quantity; those requiring a medium quantity; and those requiring a small quantity.

What are some of the dangers of the method? We have in the past been accustomed to seeing X-ray burns of the skin as a result of ignorance or carelessness. With this new method X-ray burns of the skin do not occur. The longer rays are filtered out and attention is directed to the deep seated tissue and its reaction. It is known that malignant tissue can be destroyed more quickly than normal tissue. The malignant cells are more sensitive to X radiation. Carcinoma, however, is the least sensitive of all the malignancies,

and, in order to deliver X radiation for its destruction, a dose must be given which can just be tolerated by normal tissue. It is pretty close work. Effort is made to attack a deep-seated tumor from different sides so that different areas of normal tissue overlying the growth are X radiated, but in doing so, the mucous membrane of the intestines, bladder, etc. (if an abdominal condition is treated), will get an overdose if one is not careful, and ulcerations will occur with considerable destruction of the membrane. Injury to the bladder and the recto-sigmoid area is the great danger in treating carcinoma of the uterus. The muscle of the bladder will stand the raying because it is less sensitive than the mucous membrane. Injury of the intestines may chiefly result in ulcerations, glandular atrophy, and thrombosis of blood vessels. The mucous membrane of the small intestine is less sensitive than the mucous membrane of the large intestine. The laryngeal mucosa may also be damaged in treating regions about the neck. Complete loss of voice may result temporarily.

Secondary radiations are measured as correctly as possible in phantoms or substances approaching somewhere near the densities of the body. But the body, with its complicated anatomy, presents densities of tissues that no phantom can duplicate, so ill effects of secondary radiation are often conspicuous because many doses are given with phantom scales as a guide.

Blood changes in the patient are due to acute destruction of the corpuscular elements. In regions of the face and neck, areas on the opposite side of the head from that treated will often have falling out of hair.

The picture as presented thus far of the dangers of this method is, in simple words, that of the destruction of the living cell. The agent destroys the cell in a manner that is not completely understood. Changes of the metabolism in a cell, if the dose is too small, may be sufficient only to cause a stimulation of a growth, whereas, if the dosage is massive enough, destruction is assured.

CLINICAL NOTES.

A CASE OF SUBPHRENIC ABSCESS.

By G. F. COTTLE, Lieutenant Commander, Medical Corps, United States Navy.

November 4, 1922, F. E. J., 27 years old, weight 139 pounds, a beneficiary of the Veterans' Bureau, compensated for chronic fibrinous pleurisy and bronchitis, was admitted to the United States naval hospital, Brooklyn, N. Y., from his status of vocational trainee for observation and possible operation for chronic appendicitis. His case was studied by the medical service for a period of nearly two months prior to operation. February 26, 1923, the surgical staff explored the abdomen through an incision in the upper right rectus muscle, removed the appendix, and excised a small duodenal ulcer.

The pathologist reported that the tissue removed indicated an inflamed and hemorrhagic appendix and a healed duodenal ulcer.

The postoperative course was not smooth. For a week fever, rapid pulse, and pain in the wound indicated trouble.

Opening the wound down to the deep fascia revealed only serum. During the next three weeks the fever ranged from 98° to 101°; pulse, 88 to 98; respiration was normal. He lost 25 pounds in weight. He became pale, weak, disheartened, and anemic. R. B. C. 3,620,000, Hgb. 85 per cent leucocytes 7,950, neutrophils 72, lymphocytes 22, mononeuclears 6. Urine normal; no albumen or casts.

Examination one month after his abdominal operation showed that the right lung was dull to flat at the base posteriorly, where breath sounds were absent, and that there were sibilant râles and diminished breath sounds above this area. The left lung was normal.

The abdomen showed a mass in the right upper quadrant, tender near the umbilicus, whose lower edge could not be felt; liver dullness in front was absent, being replaced by tympany.

X-ray examination showed "right diaphragm high at level of fourth rib anteriorly, with considerable gas below and probably fluid in abdomen." (Fig. 1.)

Surgical exploration through the chest wall and diaphragm was considered at this time, but decided against, because it was felt that the fluid was in the chest and not in the abdomen, and it was thought to be secondary to an infected abdominal wall and to an

old pleurisy he was said to have had prior to admission. This decision seemed a proper one. A few days after the X-ray findings above described the abdominal wound opened and discharged pus and some sloughing fascia. During the second month after the operation the wound drainage gradually decreased, and there was slow gradual improvement.

As the drainage lessened the temperature became lower, weight no longer decreased, and the patient even gained a little strength.

By June 9, three and a half months after the abdominal operation, he had a normal temperature, was going out of the hospital frequently to his home, but his pulse rate remained slightly elevated; he did not regain his former weight; he looked sallow, and the signs of fluid at the right base showed no definite regression. However, he felt himself to be convalescent and was very anxious to be discharged from the hospital so that he might go into the country to recuperate.

During these three and a half months several X-ray pictures were taken; the fluroscope and X-ray plates had satisfactorily convinced everyone that fluid was present. The roentgenologist had been persistent in his original statement that the fluid was probably in the abdomen (figs. 2 and 3), but the physical signs and other clinical evidence failed on study to bring about any unity of clinical opinion. Members of the medical service took sides one against the other, and the same was true of the surgical staff. Sufficient time having been thus given for absorption of the fluid without result, the medical service advised aspiration as a diagnostic and therapeutic measure.

The surgical service felt that aspiration was dangerous because of the possibility of infecting the pleura should the needle go through the pleura and diaphragm into the abdominal cavity. In view of these uncertainties, the commanding officer's opinion was sought and he advised aspiration.

On June 15, 1923, about four months after the abdominal operation, a needle was inserted in the postaxillary line between the seventh and eighth ribs for a distance of about 4 inches. First gas and then a thick pus, with a foul colonlike odor, was aspirated. The pus was sent to the laboratory for a report on its bacterial content. After culture this was reported to be a gram positive bacillus and diplococcus. No colon bacilli were present.

The day after aspiration the course of the needle puncture was followed by operation on the chest wall, parts of the seventh and eighth ribs being resected. The needle, again inserted, drew pus. Incision of the interspace between the eighth and ninth ribs failed to reveal pus but did show a thin-walled, glistening pleura and a bit of

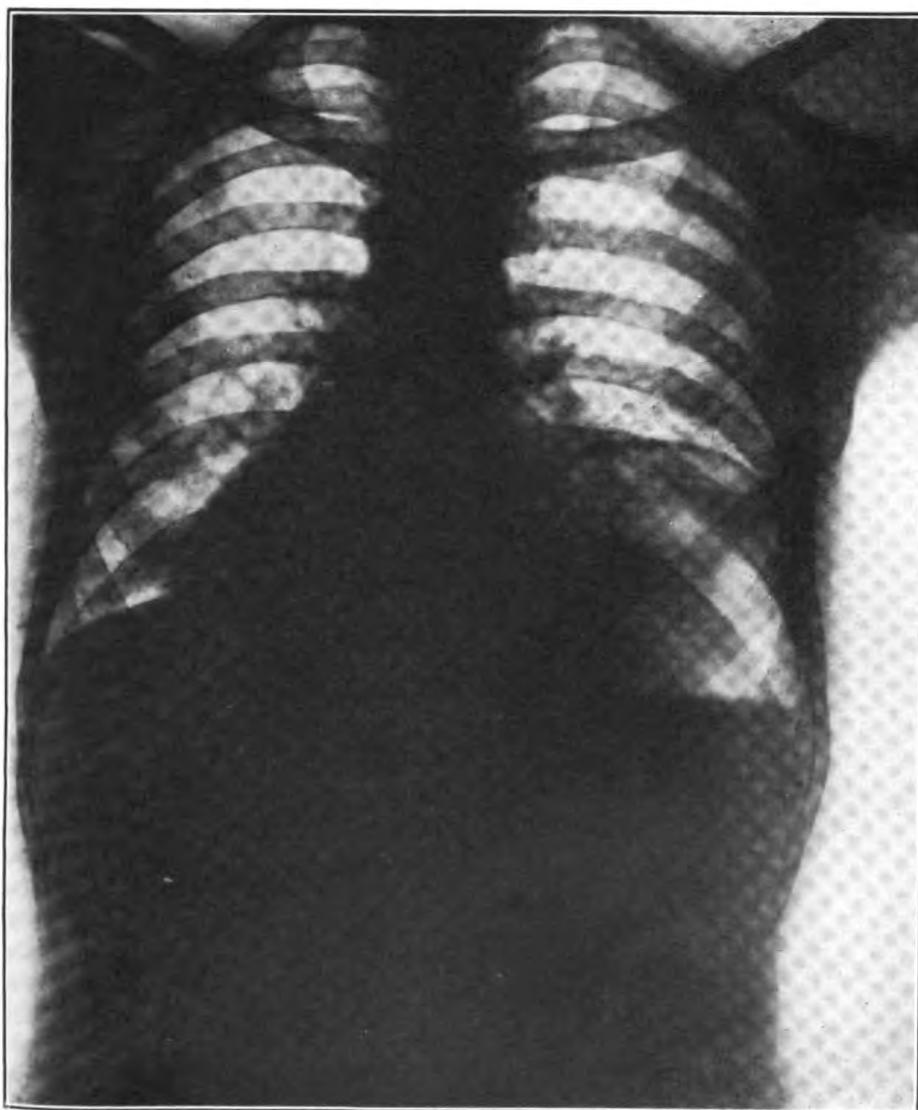


Fig. 1.—High right diaphragm, gas and fluid, March 28, 1923.



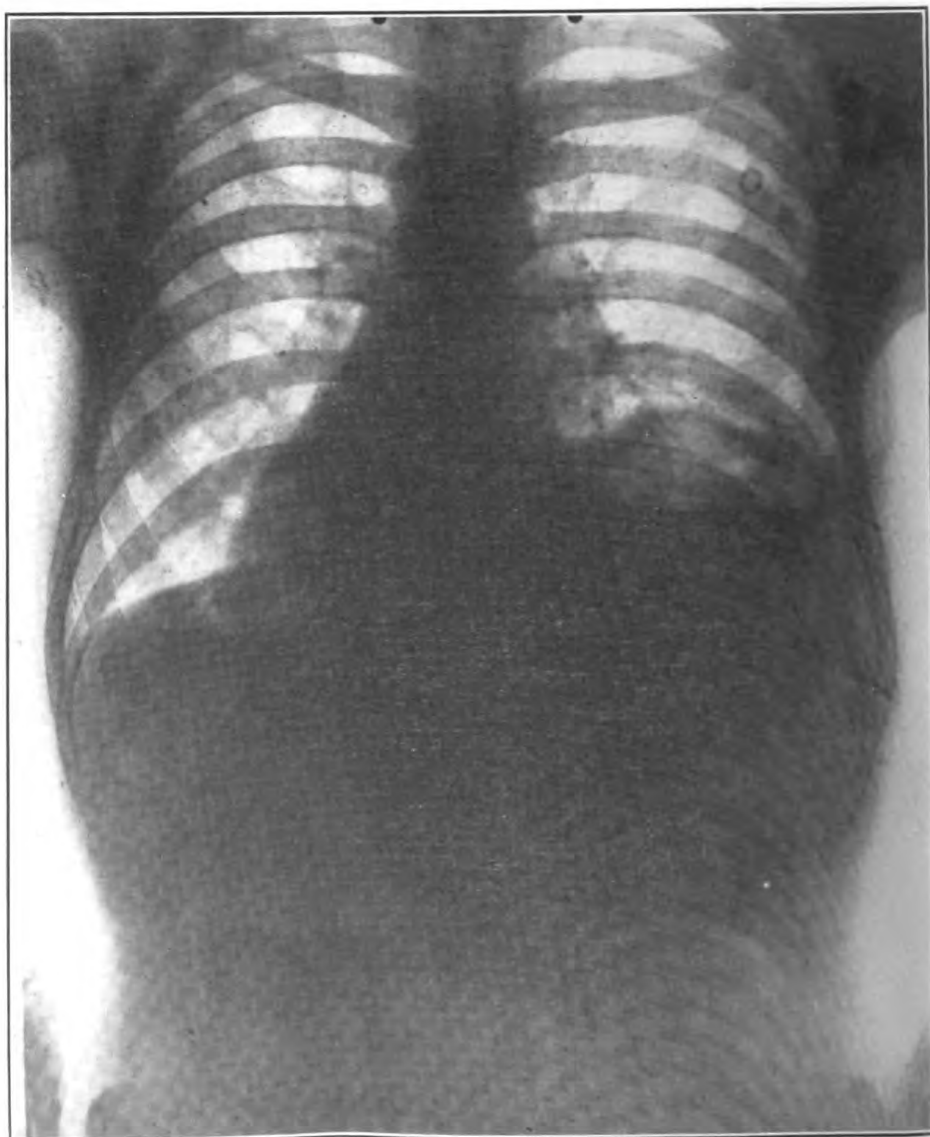


Fig. 2.—Patient in standing position, June 8, 1923.



Fig. 3.—Patient lying on his side, June 9, 1923.

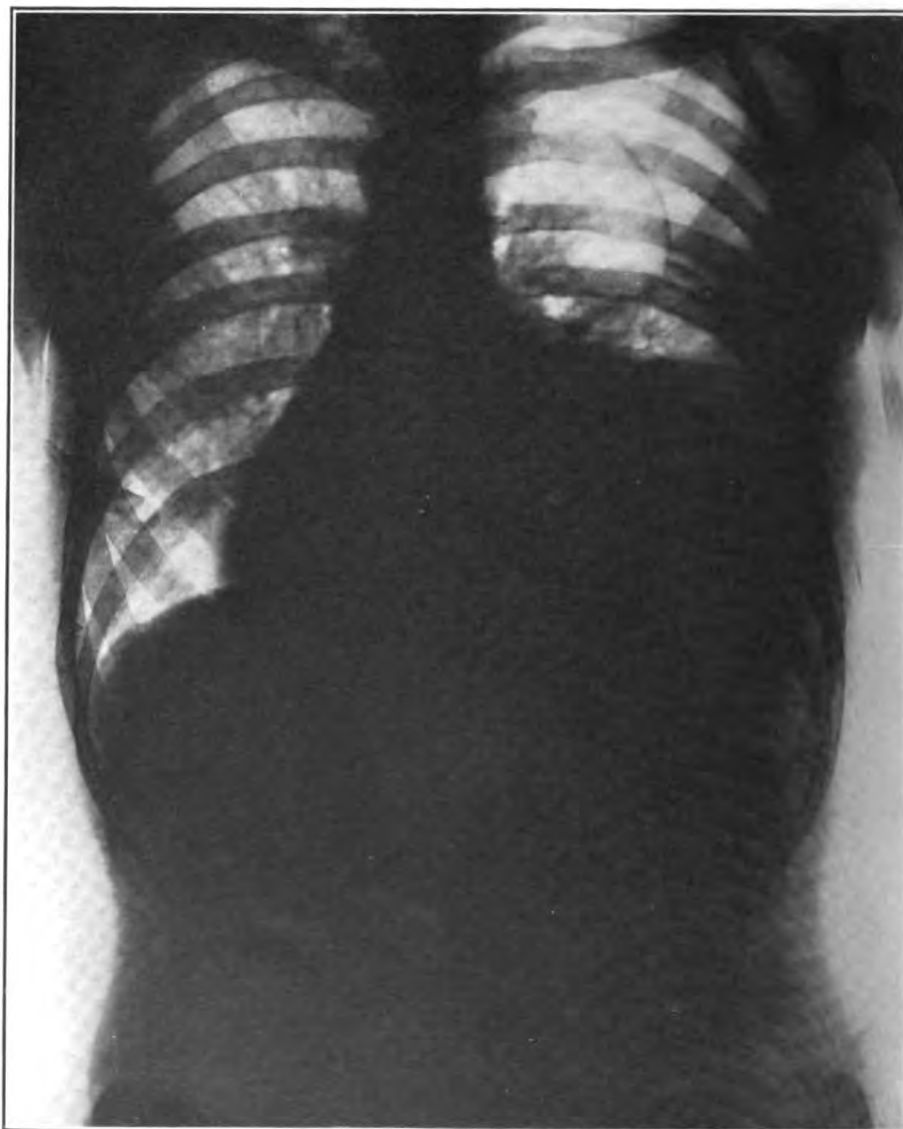


Fig. 4.—Pneumothorax caused by the first attack on chest, June 22, 1923.

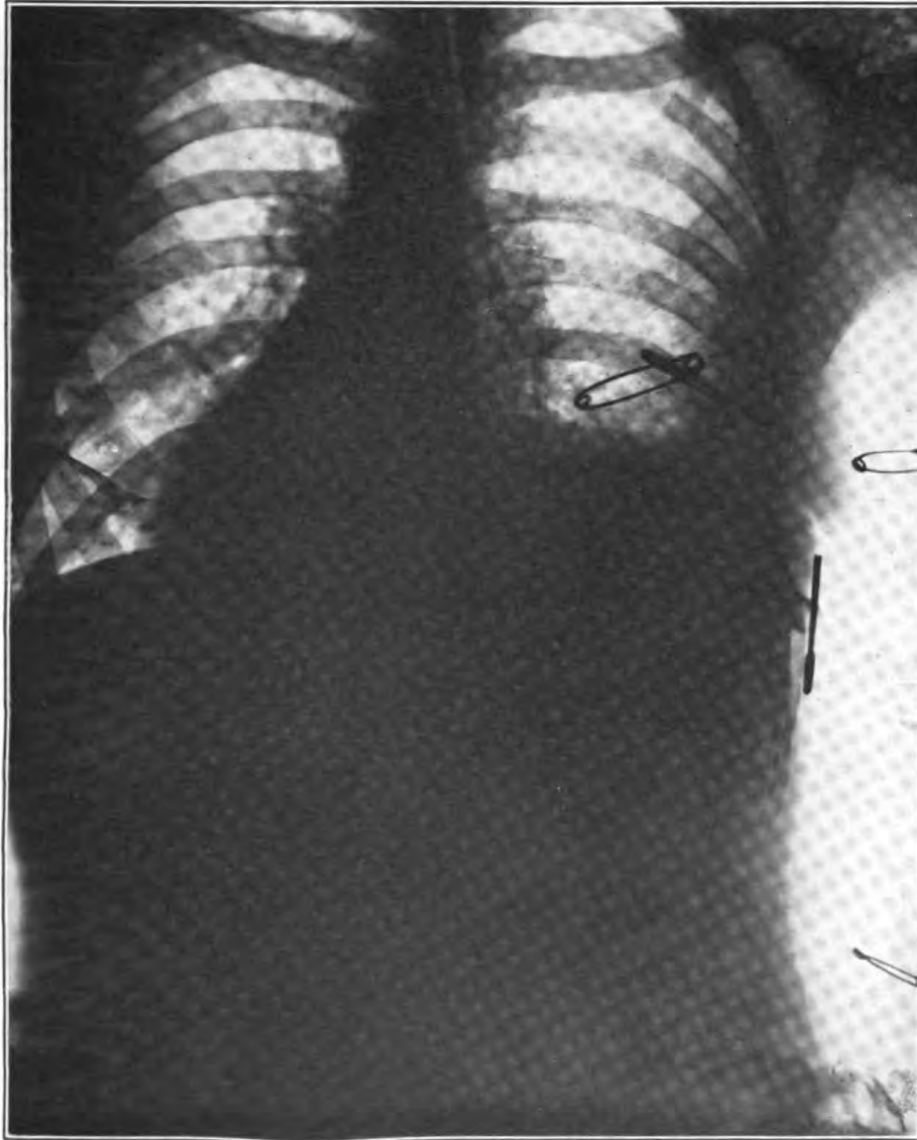


Fig. 5.—Pneumothorax gone, tube through diaphragm, high diaphragm is subsiding.





normal lung. Through this opening into the normal pleura air was being aspirated.

The opening was therefore plugged with gauze and the decision reached to wait until later before penetrating the diaphragm beneath which it was now certain the fluid pus lay. No symptoms other than slight elevation of temperature, pulse, and respiration developed, although pus had twice been drawn by a needle through normal pleura and operation had caused a partial pneumothorax as demonstrated by X ray. (See fig. 4.)

June 23, 1923, a week after the pleural opening had been plugged, a second resection of ribs, this time parts of the ninth and tenth, was done and the diaphragm incised through the interspace between them. Foul-smelling pus and gas were evacuated and a large tube inserted.

On July 14, 1923, his weight was 124 pounds, a gain of 14 pounds in about two weeks. His chest wound was draining very little. His color and appetite were good and he was apparently on the road to a complete recovery.

The X-ray plates taken July 9, 1923, show a marked change for the better and indicate that the pneumothorax caused by opening the normal pleura has cleared up. (Fig. 5.)

Comment.—This case is a postoperative complication seldom seen and when seen rarely reported in detail.

It is especially interesting, because it illustrates how the X-ray plate properly interpreted may aid in diagnosis. In looking back it would seem that the history and X-ray findings should have made the diagnosis certain at a much earlier moment, but sufficient experience with X-ray plates in this particular type of case to give these very definite findings a proper evaluation was lacking.

The delay in diagnosis does not seem to have permanently injured the patient, except for loss of time. In fact, delay probably permitted a great reduction of bacterial virulence in the closed cavity and in that way perhaps lessened the danger of infecting the pleura at the time of aspiration and operation, a danger which is a very real one. Had the diagnosis of subphrenic abscess been made prior to the operation on the chest a low attack on the chest wall would have been made instead of the higher one which followed the first needle puncture.

Opinions as to the location of the pus, however, were divided until exposure of thin-walled normal pleura eliminated the chest from the picture.

This case is reported especially because of the series of X-ray plates which so clearly demonstrate the condition, now that the story is told and reviewed.

NOTES AND COMMENTS.

In the *Journal of Tropical Medicine and Hygiene* of July 16, 1923, we find the following note on flowering plants and their old-time uses contributed by Dr. James Cantlie:

"The uses of aromatic plants and their essences have gradually lessened in their universality since tobacco came to be used. Time was when the odor of flowers and of flowering plants was a study closely followed and a creed of one's belief. Flowers were not cultivated in our gardens in early times for show for the most part, but for their uses in the prevention of disease, for religious ceremonies, etc.; when mankind dwelt in the open country to a greater extent than is the case now; when flowers were no rarity as they are within the crowded cities of the twentieth century; and cut flowers are placed in our dwelling rooms because potted plants do not thrive there.

"The writer has lately been inquiring into the nature of the plants and flowers used in towns of, say, two or three centuries ago as compared with those of to-day. In the cities of more ancient date drainage was, as we know it to-day, wholly unknown. Open sewage channels, cesspits, middens, and removal of excretion by buckets of faulty finish polluted the atmosphere with unsavory odors. The air of the churches was foul; gatherings in town halls were smelly to a degree; schools, with closed windows and long hours of attendance from, say 8 in the morning to 6 in the evening, with all too scant accommodation, made the life of the child a drudgery and tended to weaken those who actually escaped the heavy mortality among the children attending schools.

"Under these circumstances something had to be done, and the only device which seemed possible was overcoming the foul air and the effects thereof by incense burning in churches, by scattering aromatic flowers at public meetings, by strewing herbs sprinkled with vinegar in our law courts and in jail to serve as prophylactics to overcome jail distemper; the custom of placing bouquets on the chairman's table at meetings and before judges in court arose from the same reason.

"These practices came specially into vogue during the great plague of London, which lasted well nigh 100 years, for it is a mistake to imagine that the great fire of London stayed the plague.

The effect of the great fire was to scatter plague over rural Britain by driving the plague-infected rats from their burrows to spread the disease broadcast from London to the provinces until the utmost corners of the British Isles became infested. Every aromatic plant and flower was cultivated, and huge prices were paid for several; mignonette, thyme, the geranium, and a number of others were placed in our windows to prevent flies, fleas, and other insects finding their way into houses. The custom remains to-day in rural England from times when malaria reigned supreme. In our villages the geranium remains the chief decoration of our cottagers' window sills, as the plant was considered to be forbidding to winged insects passing the geranium with its musty odor. Curtains likewise came into vogue, especially where glass was not as yet in universal use. The curtain was of fine mesh, through which the insects could not pass; and to-day we find the combination of the geranium and muslin on the cottager's window. The following was one of the several answers sent to my inquiry per Mrs. H. Roper, who undertook the inquiry of the plants and flowers now in use at official time-honored ceremonials in and around London.

"The letter emanated from the secretary of the Royal Botanic Gardens, Kew, by the courtesy of the director of the gardens, who states that he regrets that, although a long search has been made in the library, so little information of a definite and satisfactory character has been obtained.

"The rue (*Ruta graveolens*) is known to have been used at the Old Bailey. Both this and wormwood (*Artemisia vulgaris*) were regarded as valuable prophylactics. A writer in the *Gardeners' Chronicle*, Volume IV, 1875, page 645, referring to the rue as forming "one of the component parts of the celebrated French prophylactic known as the Vinaigre à quatre voleurs, which was supposed to be an efficacious remedy against the plague," says: "In this capacity, indeed, rue was in great repute among ourselves. It was long, and probably still is, the custom to strew the dock at the central criminal court of the Old Bailey with rue; and in Lawrence's *Life of Fielding* we are told that this use arose after a contagious disease, known as the jail distemper, which had been engendered by the foul atmosphere there, in or about 1750, after which herbs sprinkled with vinegar were strewn about to avoid the recurrence of a similar catastrophe."

"In 1673 Archer (*Every Man His Own Doctor*, p. 119) wrote of the rue: "It is a great antidote against all infection, plague, poisons, etc."

"From statements found in various books it seems probable that other plants besides the rue were used, and apparently for a similar

purpose, but it has not been possible to ascertain precisely what they were. They are sometimes referred to as "aromatic herbs," and it is probable that among them were balm (*Melissa officinalis*), lavender (*Lavandula vera*), hyssop (*Hyssopus officinalis*), tansy (*Tanacetum vulgare*), marjoram (*Origanum vulgare*), camomile (*Anthemis nobilis*), costmary (*Chrysanthemum balsamita*), basil (*Ocimum basilicum*), sage (*Salvia officinalis*), winter savory (*Satureia montana*), pennyroyal (*Mentha pulegium*), and other mints, for these and several others are included in a list of "Strewing herbs of all sorts," published in Thomas Tusser's *Five Hundred Points of Good Husbandry*, published in 1577. To them almost certainly should be added the rosemary (*Rosmarinus officinalis*), which is not included in Tusser's list.

"Mrs. Roper may be able to see Miss Lambert's articles on "The ceremonial use of flowers," published in the *Nineteenth Century*, No. 19, September, 1878, and No. 39, May, 1880. This publication is not at Kew, so the director can not say whether or not the articles contain such information as is now required. W. A. Barrett's "Flowers and Festivals" (London, Rivington, 1873), also not at Kew, may be worth consulting. It could no doubt be seen in the British Museum.

"It is announced that a work on *Curious Survivals*, by Dr. G. Williamson, has recently been published by Herbert Jenkins, and that it contains allusions to the practices referred to in Mrs. Roper's letter, but the director does not know whether any attempt has been made to identify the herbs said to be used.'

"The chief clerk writes from the Mansion House:

"In reply to your letter of June 21, 1923, the florist informs us that the following are the herbs which composed the bunches of flowers you mention: Mignonette, cornflowers, marigolds, pyrethrums, coreopthens, love-in-the-mist, and iris.'

"A number of the aromatic herbs used in cookery are ascribed by Doctor Sambon to their uses as intestinal disinfectants, most being regarded as vermifuges and anthelmintics. The onion and shallot are in universal use. The peppers—red, white, and black—are intestinal stimulants, as being especially useful by their action on the colon.

"Of late years the flowers of our gardens, especially for the past 50 years or more, are largely hybrids come from original aromatic herbs and flowers formerly used for medicinal purposes and as deodorants.

"The many essences, especially those of Chinese and Indian origin, are used largely also as deodorant and gastrointestinal disinfectants, stimulants and anthelmintics, and as scents, when baths were less used than now, as a means of obscuring 'body' emanations.

"The subjects of aromatic bitters, oils, essences—such as cloves, carraway, peppermint, thyme, eucalyptus, balsams, gum resins, etc.—are interesting. And inasmuch as their effluvia or specific odor finds exit by way of the skin, the breath, the excretions of the kidneys, and the bowel proves that on their passage through the body they must penetrate the tissues, and an effect for good or evil may result. Flowers and plant odors may therefore have some of the consequences ascribed to them in ancient lore, and the witches' tales of cant and mystery which charm our poems and tales of love may have a basis of fact which we are ever too ready to condemn as emanations of fancies and hysterical beliefs."

In November, 1921, a commission, formed at the request of the American Gas Association, began an investigation to determine the best means of treating individuals poisoned by illuminating gas. The work of this commission was finished on March 1, 1923. The research undertaken and the conclusions reached are summarized in a final report which appears in the *Journal of Industrial Hygiene* of August, 1923, a portion of which follows:

"Inquiry was first made as to the condition of patients when first found after exposure to illuminating gas. It became apparent that, although seriously affected individuals are practically always unconscious, they are usually still breathing. This breathing may be feeble and ineffectual, but in patients who recover respiration is practically never absent when the victims are first seen. The situation differs from electric shock. In electric shock the respiration ceases suddenly and the heart continues for a brief time. Victims are revived if some one starts artificial respiration at once. In gas poisoning, on the other hand, there is frequently a long period of unconsciousness, during which the respiration is, at first, more vigorous than normal. Then follows a period in which breathing is shallow and ineffectual; finally respiration fails. While the circulation may be fair when respiration stops, the circumstances attending gas poisoning are such that aid rarely appears just as the respiration ceases. When first discovered victims are either dead or else, though unconscious, they are breathing slightly or even fairly well. If, now, we inquire into what is done for such individuals, we are unable to find that such devices as the pulmotor and the lungmotor are more efficient, in the instances in which artificial respiration is necessary, than is the manual prone pressure method of resuscitation. At the same time, it is evident from our investigations that, if rescue crews do possess apparatus for artificial respiration, they use their machinery at times even though the victim's breathing may be excellent.

"We are thus faced with the fact that if a person in one of our large cities is overcome by gas he is very likely, whether he needs it or not, to experience a period of artificial respiration by means of some such device as the pulmotor or the lungmotor—a device which alternates positive blasts of air with suction, thus producing inspiration and expiration in a manner exactly contrary to the meaning of these words and to the normal physiology of breathing.

"The commission next investigated what happens to seriously gassed patients taken to representative hospitals in Boston, New York, and Philadelphia. The significant facts obtained, which are related to the resuscitation problem, are as follows: In a series of 860 patients admitted to hospitals because of gas poisoning 59.8 per cent were unconscious; 27.8 per cent showed abnormal amounts of moisture in the respiratory tract; 5.9 per cent eventually developed pneumonia (these pneumonias were cases actually diagnosed; study of the records indicates that the true percentage is probably higher, numerous cases with slight patches of broncho-pneumonia being undiagnosed); and 14.5 per cent died. Serious cases, as has often been reported before, show low blood pressures, and cardiac arrhythmias and dilation are not infrequent. This delineation of the situation has been published as the second report of the commission.

"In view of the facts thus disclosed, the commission, in October, 1922, felt it advisable to make inquiries in three lines:

"1. Since at the present time the use of resuscitation apparatus, such as the lungmotor and the pulmotor, is widespread, and since it is evident that if such apparatus is at hand it is employed, even if the breathing of the patient requires no assistance, the question arose as to whether exuberant use of positive pressure ventilation might not cause immediate cardiac or circulatory failure in seriously gassed patients. It is known that artificial respiration of positive type increases at each blow the pulmonic blood pressure by compressing the pulmonary capillaries. The load which can be thrown suddenly upon the right ventricle in this way may be considerable and, accepting the fact that such machines as the lungmotor and pulmotor occasionally do drive the full air delivery of the instrument into the alveoli, the possibility of doing harm is easily recognized. It has, however, been shown by workers for the commission in a series of experiments upon cats poisoned with illuminating gas that this apprehension in regard to positive pressure respiration apparatus is unfounded. In the same investigations lung rupture did not occur, even though extreme pressures were used.

"2. Since pneumonia is a fairly frequent and very serious sequel of gas poisoning, and since one-fourth of gassed patients receiving

hospital treatment have excess fluid in their respiratory tracts, the question was asked as to whether positive ventilation, if effective, might not aid in the distribution of infected mucus to the alveoli and so increase the incidence of pneumonia. A series of experiments upon dogs and cats has shown that artificial respiration carried on through a mask by an instrument, such as the lungmotor, does cause an increase in the amount of tracheal material which reaches the lungs. The possibility, therefore, exists that positive-pressure artificial respiration, operating through a face mask, may increase the incidence of pneumonia after gassing.

"3. Since few data exist as to the actual ventilating efficiency of the lungmotor and the pulmotor, experiments have been performed upon dogs which have shown that, while nonbreathing animals (curarized) can be kept in good condition by such devices, the amounts of air delivered have to be modified in accordance with the condition of the animal at the moment. An experienced physiologist can do this successfully but, out of medical hands and with the simple directions which can be given nonmedical life savers, it is not probable that the machines can be operated with the success that is attributed to them. The investigators were surprised to find how readily small amounts of obstruction in the upper air passages stopped the air flow when positive ventilation was being used. It is this fact which necessitates constant watchfulness upon the part of the operator and readiness to adapt the volume of air delivered to the needs of the patient. A further practical difficulty in using positive pressure respiration through a face mask was found in experiments upon individuals, apneic after forced breathing, and upon the bodies of persons dead less than two hours. This consists in the ease with which leaks occur around the edges of the mask. These leaks are invariably greater when air is blown in than when it is sucked out, since during the latter maneuver the skin of the face is drawn against the rim of the mask and seals off some of the leakage. As a consequence, the victim, upon whom the face mask is not adjusted with the greatest accuracy, experiences a gradual diminution in the size of the chest and an interference with alveolar air exchange which can not be advantageous.

"Finally the question of the actual efficiency of the Schafer prone pressure method of artificial respiration was reviewed, and the conclusion was reached that this method is even more efficient than has been supposed; that is, evidence exists which indicates that the Schafer method is not simply our best reliance for brief emergencies, but that through its use life may be sustained over considerable periods of time in persons unable to breathe.

"The experimental evidence and discussion of these matters make up the third report of the commission.

"The development of a new method of treatment of gas poisoning is entirely due to the work of Dr. Yandell Henderson and Dr. H. W. Haggard and forms the most important contribution made by the commission. The extreme simplicity of the measure proposed and the apparent completeness with which it meets the needs of gassed individuals can not be overemphasized. Three well-known facts form the basis for the method. They are:

"1. Carbon monoxide combines with hemoglobin, displacing oxygen, and the harm done in gas poisoning arises from the oxygen deprivation which results.

"2. The most effective physiological means for breaking down the combination of carbon monoxide and hemoglobin is offered by the mass action of oxygen; that is, in the presence of large amounts of oxygen, carbon monoxide is forced out of the hemoglobin molecule more rapidly than in lower oxygen concentrations.

"3. The most effective physiological stimulus for respiration is carbon dioxide.

"Because of these three facts and because of the observation that in gassed persons the carbon dioxide content of the body is low, owing to the period of excessive breathing which precedes the stage of shallow respiration and respiratory failure, Henderson and Haggard have advocated the use in gassed cases of inhalations of 5 per cent carbon dioxide in oxygen. They have shown in gassed animals and in themselves that this mixture, because of the carbon dioxide content, causes a great increase in respiration. This respiratory increase fills the alveoli with a very high percentage of oxygen, and thus displaces carbon monoxide from the hemoglobin molecule with the greatest possible expedition. They have also shown that the breathing of this carbon dioxide-oxygen mixture is attended by no danger to the subject. Following these observations, Henderson and Haggard tested the carbon dioxide-oxygen treatment upon gassed persons in New York City. Further experience with the method, both in reviving gassed persons and in hastening recovery from etherization, has served to increase the confidence of the commission in the wisdom and safety of a treatment which not only meets an immediate emergency but also, by shortening the period of oxygen lack, reduces the frequency after gas poisoning of unfortunate sequelæ. The development of this new treatment forms the subject matter of the first report of the commission.

Among the relics of medical practice of the Renaissance period may be found the doctrine of signatures which appears to have been first promulgated in the sixteenth century by Philippus Aureolus

Theophrastus Bombastus of Hohenheim, who called himself Paracelsus and enriched the English and other languages by adding to them, unintentionally, the word "bombast." Although he was a doctor and a professor at Basle, who made great advances in chemistry and therapeutics, yet he was a very notorious quack. The doctrine of signatures, says the British Medical Journal of August 11, 1923, may be stated in the words of Robert Turner, who wrote:

"'God hath imprinted upon the plants, herbs, and flowers, as it were in hieroglyphicks, the very signature of their vertues.' The doctrine of signatures professed to do this by finding either resemblances between the plant and the part of the body affected or between the plant and the cause of the disease. Thus, a plant with heart-shaped leaves is good for heart disease; the plant known from the shape of its leaves as the adder's tongue will cure the bite of an adder. William Cole, a fellow of New College, Oxford, and a resident of Putney, carried this doctrine to great lengths. We owe to Mrs. Arber's book on herbals the following quotation from Cole, in which a most elaborate application of the doctrine occurs: 'Wall-nuts have the perfect signature of the head: The outer husk or green covering, represent the pericranium, or outward skin of the skull, whereon the hair groweth, and therefore salt made of those husks or barks are exceedingly good for wounds in the head. The inner woody shell hath the signature of the skull, and the little yellow skin, or peel, that covereth the kernell of the hard meninga and pia-mater, which are the thin scarfes that envelope the brain. The kernel hath the very figure of the brain, and therefore it is very profitable for the brain and resists poysons; for if the kernel be bruised, and moystened with the quintessence of wine, and laid upon the crown of the head it comforts the brain and head mightily.'"

Prof. Leonardo Bianchi, the great master of Italian neuropathology and psychiatry, is this year relinquishing the professional chair at the University of Naples to the profound regret of his colleagues and students. We learn from the *Lancet* of August 18, 1923, that Doctor Bianchi took for his farewell address the subject of old age, perhaps in reference to the fact that his retirement was occasioned by the age limit, and it is characterized by much interesting material and relevant remarks. Life is regulated, says Doctor Bianchi, by laws of whose nature we are only partly cognizant. We do not know why certain individuals develop precociously, or why the germ of a great talent arrives at maturity only after a long time in the most diverse changes and circumstances of life—and in his address he went on to draw an eloquent picture of old age as it might be, which the *Lancet* renders in his own words:

"How many men lay down their arms in life's struggle before reaching the age of 60! Without any more enthusiasm or eagerness, or even a new thought or application, with no longer any artistic thrill, nor any ambition, not even a hymn to life or to beautiful and generous nature. Such men shut themselves in the spiral recesses of an inert habit. What is the reason why one man is degenerate at 60 years and another preserves his mental faculties at 85 or even 90 or more? There is no biological law which fixes the term when decadence of the mental life begins; there is nothing absolute in this matter. The absolute is found in human laws, often inspired by extraneous interests, associated with profound ignorance of the infinite resources of nature. Meanwhile let us respect this law, our duty. There is something which watches over individual interests, and that is discipline. Obedience, in proportion as the social organism becomes more complex, is the greatest human virtue! Erect an altar to it and let it be your law.

"As for myself, as long as I have strength and energy I will dedicate to you my whole thought. We were and are all enthusiasts of youth. I might almost say by occupation. Countless times it has incited my thoughts and rendered verdant year by year my existence with springlike fertility. Living for several decades among you I have felt year by year the reflex of your spirit in myself, with the enthusiasms and generous impulses of youthful years, the hopes wooed by severe struggles, and the anxieties of work animated by an innate yet indefinite force which rendered even joyous the privations hidden under a chaste and sometimes painful gaiety. Youth must tend to become sublimated as it pushes forward toward maturity and old age, which give force and experience to the prosperous life of the race.

"Happy are they who reach without much travail or severe losses the extreme limit of life; and fortunate is the country where a lucid and cheerful longevity is not an isolated and exceptional phenomenon. And remember that the foundations of a strong old age are laid in the vernal years of life. Let me before taking leave of you give you this advice. Keep a part of your youthful energies for maturity and old age, whose activities are the right of the civilization of the race. With all the respect due to certain researches on rejuvenation, do not delude yourselves as to the results. The rejuvenation of rats and fowls may be nothing else than a firefly for man; just as illusory as the vital sun that Brown-Sequard dreamed of as standing still in order to carry on victoriously the battle of life. The conception of Goethe will remain eternal as regards humanity, and the modern Mephistopheles, decked out by the laboratory experimenter, will in vain bring you an amorous Marguerite if your vital balance results

in a deficit in the years of youthful enthusiasm. Devote yourselves to the work of the community, and you will be very happy to feel yourselves even at the age of 75 useful to your country. This is my most fervid wish for you."

We learn from *Science* of December 15, 1922, that a new method of killing rats, now being tried out in Hawaii, consists in distributing poison cakes through the sugar-cane fields and noncultivated areas. The poison used is barium carbonate. This is mixed with flour dough, which is then made into small round cakes and coated with paraffin to protect them from dampness and molding.

A man on horseback dropping a rat cake every 10 feet can cover an area of 35 acres in a day, at a total cost of 16 cents per acre. This procedure repeated three times a year is reported as sufficient to control the rat pest on the islands.

The July number of the *Journal of the National Dental Association* contains an article by John G. Meisser, D. D. S., of the Mayo Foundation at Rochester, Minn., entitled "Focal infection as a cause of diseases of the urinary tract." Such an article is entitled to attention by both the medical and dental professions, offering light as it does upon one of the possible causes of diseases which have often shown little improvement under medical treatment. In the article attention is invited to the fact that nonvital teeth showing no evidence of periapical infection by radiographic means upon extraction give positive cultures similar to those obtained from teeth showing radiolucent areas about the apices. Another feature of importance found in the article is that carious teeth in which there was pulp involvement also gave the same positive bacteriological findings. As a matter of interest, it might be stated that urinary calculi were found in the kidneys of dogs 3 months and 27 days following devitalization and infection of teeth with streptococci found about the teeth of patients who were thus afflicted.

A pleasant refinement for routine dental office practice has been found in having ready for immediate use at all times a supply of cotton rolls in a sterile condition. This is attained by cutting original rolls into four sections and wrapping three of these sections in a small piece of unbleached muslin. The muslin is torn into pieces about 4 inches square, which enables the rolls to be wrapped diagonally in the piece, leaving the loose end to be tucked in and thus

obviating the necessity for securing with pins. These are kept in the upper left section of the dental cabinet with other sterile packages. A large number of the packages are prepared weekly, autoclaved, and the cabinet supply replenished as required. The muslin wrapping and any remaining rolls after the conclusion of each operation are thrown into the waste receptacle in the lower right of the cabinet and used the next time a fresh lot is prepared for autoclaving. The practice of reaching into a receptacle containing loose rolls while engaged in an operation is hardly consistent with surgical practice.

In order to meet the growing demand for more and better-trained physicians in the field of preventive medicine as applied to children, the American Child Health Association offers certain resident and travel scholarships to physicians who desire to improve their qualifications for child health work. The sum of \$10,000 has been allotted for scholarships to be awarded in amounts determined by the character of the work to be accomplished during the school year 1923-24 and the summer of 1924.

Physicians interested in this opportunity may obtain further information by addressing the American Child Health Association, 370 Seventh Avenue, New York City.

In connection with some remarks on the treatment of the dyspnea of bronchial asthma, Dr. James Wynn, in the *Journal of the Indiana State Medical Association* of July 15, 1923, sounds a warning regarding the interpretation of protein anaphylactic skin tests.

"In a decade when the relationship of bronchial asthma to the state of sensitivity to foreign protein has been clearly emphasized by so many workers, no case has been properly studied until any possible offending proteins have been identified. This necessitates a critical history and careful skin testing. False and misleading conclusions are only too often reached if the skin reactions are interpreted carelessly or by one who is not familiar with the variations which may occur within the limits of what the trained observer will recognize as normal. After a fairly extensive experience with skin testing, I feel certain that though the scratch test of Walker is the most reliable, more conservatism must attend its interpretation. Before one is justified in making a positive diagnosis, the site of scarification must show a wheal or the eczematous reaction, and these observations must be checked on at least two and preferably three different days, on different parts of the body."

In past issues of the BULLETIN notes on the various aspects of venereal disease of interest to naval medical officers have appeared. For the most part these notes were extracted from Venereal Disease Information, a monthly mimeographed pamphlet issued by the Division of Venereal Diseases, United States Public Health Service.

Recently this publication has appeared in printed form. The magazine is intended primarily for health officers, physicians, nurses, and social workers engaged in venereal-disease control activities. Each issue is to contain special articles on the venereal-disease problem and brief abstracts of articles dealing with venereal diseases which have appeared in current publications, both foreign and domestic. The contents will be divided into six sections under the heads of special articles, research, diagnosis, treatment, clinical notes, and public health and administrative notes.

The value of this publication to the naval medical officer is apparent, and the Bureau of Medicine and Surgery has made arrangements to supply it to each ship and station.

Medical officers who served in the British Isles during the late war will be pleased to learn that Surgeon Rear Admiral Joseph Chambers has been appointed director general of the Medical Department of the British Navy, in succession to Surgeon Vice Admiral Sir Robert Hill, to date from October 1, 1923.

The new medical director general stands third on the list of the six surgeon rear admirals, and since last October has been in charge of Plymouth Hospital. He had formerly been second in charge at Haslar Hospital. An officer of much experience, he was specially chosen in 1908, when a fleet surgeon, as health lecturer at the home ports. Afterwards he was in charge of the hospital at the Cape of Good Hope, and in 1913 became medical officer of the cruiser *Suffolk*, the original flagship of the late Rear Admiral Cradock in the war. From her he was appointed, in December, 1915, to Chatham Hospital, where he remained until advanced to surgeon captain in July, 1919.

INSTRUCTIONS ISSUED BY THE BUREAU OF MEDICINE AND SURGERY.

Circular letter.
Serial No. 277-1923.

WSD/MG 124942-0.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 18, 1923.

To: All naval hospitals, continental limits and Pearl Harbor; Naval Medical School, Washington, D. C.; post surgeon, marine barracks, Quantico, Va.; senior medical officer, naval training station, Hampton Roads, Va.; naval medical supply depots, Brooklyn, N. Y., and Mare Island, Calif.

Subject: Civilian employees, military preference.

References: (a) M. & S. circular letter, serial No. 275-1923, #124942-0, June 30, 1923.

Inclosures. (A) Navy Department circular letter #SONYD-7-VR, March 23, 1923.

(B) Navy Department circular letter #SONYD-7-VR, April 25, 1923.

1. In connection with the reduction of civil personnel required by reference (a), attention is called to the Executive order of March 3, 1923, regarding preference to be given ex-service employees, as set forth in inclosures (A) and (B).

2. The paragraph of the Executive order particularly applicable at this time reads:

"In the event of reductions being made in any part of the classified service, no person entitled to preference in original appointment shall be discharged or dropped or reduced in rank or salary if his record is good."

3. In effecting reductions in force especial care will be taken to comply with the above provision.

E. R. STITT.

[Inclosure.]

Circular letter.

SONYD-7-VR.

NAVY DEPARTMENT,
Washington, April 25, 1923.

From: Assistant Secretary of the Navy.

To: Chiefs of bureaus, boards, and offices; commandants all naval districts; commandant navy yard, Washington, D. C.; commanding officer naval air station, Anacostia, D. C.; inspector of ordnance in charge, naval proving ground, Indianhead, Md.; naval torpedo station, Alexandria, Va.; naval ordnance plant, South Charleston, W. Va.; commanding officer naval hospital, Washington, D. C.; Superintendent Naval Academy, Annapolis, Md.; Major General Commandant, headquarters, U. S. M. C.

Subject: Military preference, Executive order of March 3, 1923.

Reference: Dept's cir. let. of March 23, 1923.

1. As a result of the promulgation of the Executive order of March 3, 1923, by reference, a number of questions have been submitted to the department

with respect to the effect of the Executive order. For the information and guidance of all concerned there are given below the questions with appropriate answers:

1. Question. If necessary to reduce force composed entirely of employees in like ratings, all of whom are entitled to military preference, on what basis should discharge be made?

Answer. On basis of relative efficiency in like ratings.

2. Question. Does Executive Order apply to Groups II, III, IVa, IVb, and IVc (classified) and except Group I (unclassified)?

Answer. Department by paragraph 2 of reference specifically applied the provisions of the Executive order to all employees regardless of their classification, and therefore included Group I (unclassified).

3. Question. Can employees entitled to military preference in appointment be reduced in pay in the event of a new pay schedule becoming effective providing a lower rate of pay in certain or all ratings?

Answer. Yes.

4. Question. What is effective date of Executive order?

Answer. An Executive order is analogous to law in that it becomes effective the date it is signed by the President, unless otherwise indicated. Therefore the order of March 3, 1923, is effective on and after date of its issuance, viz, March 3, 1923.

5. Question. Assumed that employees in Group I (unclassified) are excepted from the provisions of the Executive order of March 3, 1923, unless at some time they have had a classified status.

Answer. Department has provided that Executive order shall apply to Group I employees as well as all others. See 2.

6. Question. Could a discharge or furlough be made among employees in a like rating all of whom are entitled to military preference in the event of lack of work or funds?

Answer. They could be furloughed not to exceed the number of days provided in Article 321, Naval Instructions, 1913, or discharged. In this connection, no law or Executive order presupposes the retention in employment of any employees regardless of whether they have military preference or not, when there is no work for them in the'r rating, or when there are no funds out of which their services may be paid. In the latter instance, lack of funds in a particular appropriation is immaterial, as they may be shifted from one appropriation to another, which is mere paper work detail.

7. Question. Can a supervisory or other employee whose retention in his rating is based on a requirement that he have a specific number of employees under his supervision, be reduced in rating when the force he supervises is reduced to the point where his rating can no longer be maintained?

Answer. Yes. See 6.

8. Question. If work, funds, and allowed complements are all sufficient there may still exist an excess of those with military preference in one branch or trade. How is balance of force to be obtained? For example, the force of planners may require reduction to 12; the normal balance of force as reduced might require 2 machinist planners; yet there may be 3 in the force before reduction. How would the one in excess be handled?

Answer. Assuming that all employees in the rating in excess are veterans, reduction will be confined to employees in this particular rating on basis of relative efficiency. Under existing regulations, excess employees will be returned to the shop.

9. Question. What action should be taken in the case of employees entitled to military preference who become physically unable to perform any work?

Answer. To be separated.

10. Question. What action should be taken in the case of an employee entitled to military preference who becomes physically unfit to perform the work of his rating, but is physically able to perform less arduous duties in some lower paid rating. Is reduction thereto prohibited?

Answer. No.

11. Question. In case of an employee who was not entitled to military preference when first appointed, subsequently through military service gain such status, is he entitled to preference as provided in the order, as is given to those originally appointed with military preference?

Answer. Yes.

12. Question. Is it not the intention of the order to forbid discharge or reduction of preference employees when funds or work do not warrant their retention?

Answer. No.

13. Question. Paragraph 67, Form 2009, defines "Good" as equivalent to a percentage rating of 70 to 80. The term is used for yard system of efficiency rating. It is intended that under the terms of order that the word "Good" shall be strictly interpreted in this sense?

Answer. Yes.

2. Commandants of naval districts will transmit this letter to all organizations coming within their jurisdiction.

3. Chiefs of bureaus and offices will transmit this letter to all inspection offices under their jurisdiction.

4. The Major General Commandant, United States Marine Corps, will transmit this letter to all organizations of the United States Marine Corps not under the command of naval officers.

THEODORE ROOSEVELT.

AWD/ML 125884(73).

Circular letter.

Serial No. 278-1923.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 19, 1923.

To: All naval hospitals (continental limits).

Subject: Foodstuff expended during the fiscal year.

1. It is directed that each hospital submit to the bureau an itemized total of all foodstuff expended during the last fiscal year. These totals to be compiled from the 12 monthly totals of the commissary ledger. This statement to show the quantity of each item, cost not to be considered or reported.

2. The total number of subsistence days for the fiscal year 1923 will also be given.

E. R. STITT.

Circular letter.

Serial No. 279-1923.

NLS/JBC F-4-42022.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
Washington, D. C., July 24, 1923.

To: All medical officers, chief pharmacists, and pharmacists.

Subject: Form N. M. S. H. C. 4 (Roster Report of the Hospital Corps); preparation and forwarding of.

Reference: Paragraph 404, Manual of the Medical Department, 1922.

1. To assure the uniform preparation of this form throughout the naval service, the following instructions are issued for the guidance of those concerned

and will be strictly observed. These instructions will be included in a future change in the Manual of the Medical Department.

2. Only the last revision (1922) of this form shall be used. If a supply of this revision is not on hand, immediate request shall be made to the naval medical supply depot.

WHEN PREPARED AND FORWARDED.

Weekly, by all naval training stations, Hospital Corps schools, and all naval hospitals and receiving ships (including the Naval Academy) within the continental limits of the United States.

Monthly, by all naval training stations, Hospital Corps schools, all naval hospitals, all receiving ships (including the Naval Academy), all ships and all other stations not specifically mentioned above, including marine activities and recruiting stations.

Whenever any activity is placed out of commission.

PERIODS COVERED BY REPORTS.

Weekly.—The week ending at midnight on Saturday.

Monthly.—The calendar month ending at midnight of the last day thereof.

Decommissioning.—Period since forwarding of last previous report.

INFORMATION CONTAINED ON REPORTS.

Weekly.—All permanent changes in status or station of any Hospital Corps men occurring during the week. No temporary changes in status or station of "staff" Hospital Corps men, such as admission to or discharge from the sick list, going on or returning from authorized or unauthorized leave, confinement, etc., will be reported.

Monthly.—All permanent changes in status or station of any hospital corpsmen occurring during the month. Stations submitting the weekly report will report only such changes as have occurred since the forwarding of the last previous weekly or monthly report.

A complete roster of all officers and men of the Hospital Corps staff remaining at end of month, giving surname, Christian name and initials, and all names if more than one person have the same names; rate and U. S. N. or N. R. F., date of expiration of enlistment or enrollment; original date of reporting for duty (a man may have been discharged and reenlisted since first reporting for duty); and the duty to which assigned or status of the individual, as: On ——— days' leave, on sick list (with diagnosis), and temporary duty at ———, confined, etc.

A complete roster of all "patient" officers and men of the Hospital Corps received from other activities, giving the same information as for staff hospital corpsmen and diagnosis, shall be made immediately following the staff roster.

A complete roster of all officers and men of the Hospital Corps who are passengers en route to another station or awaiting transfer to another ship or station and showing their status shall be made next following the roster of "patient" hospital corpsmen. The names of none but members of the Hospital Corps shall be reported.

Complement: The complement of hospital corpsmen as "authorized" by the Bureau of Navigation shall be reported. The complement on "board" reported shall include all members of the Hospital Corps attached to the staff

of the activity making the report regardless of any temporary loss of the services of men through leave, sickness, or other transient causes. The number of hospital corpsmen who are patients, passengers, awaiting transfer, or temporarily on board for any reason shall not be included in the numbers reported as "on board." The total "on board" shall not include the number of pharmacists.

Enlisted, received, or transferred since last report: The names of all members of the Hospital Corps affected by a permanent change in status or station shall be reported. Temporary changes, such as going on or returning from authorized or unauthorized leave, admission to or discharge from the sick list, assignment to or return from temporary duty, etc., affecting the status or station of staff hospital corpsmen, shall not be reported on this form. Advancement or reduction in rating or changes in rating to or from the Hospital Corps shall be reported as C. R.

Men moved from one duty to another at the same station, as from the incoming detention unit to medical headquarters or from Camp ——— to provost marshal, etc., at a naval training station or from the contagious camp to the main hospital at a naval hospital shall not be reported as "transferred to" or "received from" such interstation activities.

Men not transferred direct to a new station shall be reported as transferred to their final destination via a receiving ship or vessel which carries them or as transferred to a receiving ship or to the vessel which carries them for further transfer to their final destination. For example, men transferred to the Asiatic Station or a West Indies station usually are sent to a receiving ship and from there to a vessel going to the station to which they are ordered.

3. All previous instructions governing the preparation and forwarding of the Roster Report are hereby canceled.

E. R. STITT.

Circular letter.
Serial No. 280-1923.

WWB/JBC F-2-42022.

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
WASHINGTON, D. C., 31 July, 1923.

To: All medical officers.

Subject: Form N. M. S. H. C. 2.

References: (a) Manual of the Medical Department, 1922, par. 402, as changed by M. & S. letter 128014(41) of 12 April, 1923.

(b) Bu. M. & S. circular letter 270 of 22 June, 1923.

1. From the number of "Efficiency Reports, Hospital Corps, United States Navy," being received in the bureau it is apparent that paragraph 2 of reference (b) is not being complied with. This necessitates the return of such forms and needless correspondence, neither of which would have been caused had the instructions referred to in this paragraph been observed.

2. The "Efficiency Report, Hospital Corps, United States Navy," will not be used in carrying out the provisions of reference (b), and any stock of that form on hand will be disposed of at once to prevent any further use of an obsolete form.

3. Attention is directed to reference (a), and it again is directed that a request for a supply of Form N. M. S. H. C. 2 (Qualification Report, Enlisted Personnel, Hospital Corps, United States Navy, and Qualification Report, Chief Pharmacist and Pharmacists, Hospital Corps, United States Navy) be submitted at once to a naval medical supply depot.

E. R. STITT.

Circular letter.
Serial No. 281-1923.

WSG/O 130107-O(84).

DEPARTMENT OF THE NAVY,
BUREAU OF MEDICINE AND SURGERY,
WASHINGTON, D. C., *August 27, 1923.*

To: All naval hospitals and U. S. S. *Relief* and U. S. S. *Mercy*.

Subject: Semiofficial letters.

Reference: Bureau's circular letter, 130107-O, March 21, 1919.

1. The "semiofficial letters" submitted by naval hospitals to the bureau at the end of each calendar month by direction of the bureau (reference) will be discontinued from and after the receipt of this communication.

2. This action is a concession to the recommendations of commanding officers.
E. R. STITT.

The attention of all medical officers is invited to page 10 of General Court-Martial Order No. 5, 1923, dated May 31, 1923, relative to the subject of "Line of duty" in the case of retired officers.

The bureau is in receipt of many reports of death in which improper entries are made relative to the line of duty, such entries not being in keeping with the facts and circumstances under which the death occurred.

The following has been held by the Judge Advocate General:

That it has been fully established that it is not necessary that an individual in the naval service be on active duty at the time his death occurred in order to warrant the holding of line of duty. (7 Op. Atty. Gen. 149, 160; 32 Op. Atty. Gen. 193, 196, 198; *Moore v. U. S.*, 48 St. Cla. 110.) But when his death has occurred after he has been placed on the retired list of the Navy, and while he is on active duty, it is necessary that the records show that his death was caused by some incident originating while on active duty before a holding of line of duty is warranted. For example, if a retired officer while going about his private affairs had been struck by lightning or killed in some other manner wholly disconnected with the naval service or had died as a result of some disease not due to prior service conditions, his death should not be held to have occurred in the line of duty. Where, however, it is shown by the records of the department that his death was due to a disability not the result of his own misconduct, originating while in active service, the department is of the opinion that it should be held that his death is the result of an incident of the service and therefore in the line of duty. (File 26250-3145: 1, JAG, 23 May, 1923.)

E. R. STITT.

The following letter concerning the question of "line of duty" is published for the information of all medical officers:

DEPARTMENT OF THE NAVY,
OFFICE OF THE JUDGE ADVOCATE GENERAL,
Washington, 7 August, 1923.

From: The Judge Advocate General.

To: The Chief of the Bureau of Medicine and Surgery.

Subject: Request for information re misconduct status in the cases of death of Thomas Stanley Harl, seaman, second class, United States Navy, and Leslie Cecil Gill, seaman, second class, United States Navy.

Reference: (a) Bu. M. & S. letter 868617-847675 of July 2, 1923.

1. In reference (a) the bureau requests an opinion as to the line of duty holdings in the cases of the deaths of Thomas Stanley Harl, seaman, second class, United States Navy, and Leslie Cecil Gill, seaman, second class, United States Navy.

2. From the information on file in the department it appears that Harl died as a result of injuries received in a railroad wreck near Las Vegas, Nev., 15 January, 1923. At the time of his death Harl was absent without leave from the U. S. S. *Altair* at San Francisco, Calif. The immediate cause of the death of the deceased, as determined by the coroner's inquest, was the crushing of the deceased by the shifting of some lumber in a freight car in which Harl was riding.

3. Inasmuch as the information on record indicates that Harl met his death while absent without leave and while riding in a freight car as a trespasser, and that death was a direct result of the presence of the deceased in that unauthorized place, it is the opinion of this office that the death of Thomas Stanley Harl, seaman, second class, United States Navy, should be held to have occurred not in line of duty, but as a result of his own misconduct.

4. The records of the department indicate that Gill met his death 26 January, 1923, as a result of injuries received by being run over by a truck in San Jose, Calif. Gill was on authorized leave of absence at the time of the fatal accident, and inasmuch as there is no information at hand that would show that the accident was in any way caused by the misconduct of the deceased, it is the opinion of this office that the death of Leslie Cecil Gill, seaman, second class, United States Navy, should be held to have occurred in line of duty and not as a result of his own misconduct.

C. W. AUSTIN.

Approved, August, 1923.

L. W. EBERLE,

Acting Secretary of the Navy.

THE DIVISION OF PREVENTIVE MEDICINE.

Lieut. Commander G. R. PHELPS, Medical Corps, United States Navy, in charge.

Notes on Preventive Medicine for Medical Officers, United States Navy.

SIGNIFICANCE OF EXCESSIVE CHARGES OF ADMISSIONS AND SICK DAYS AGAINST THE HEALTH OF THE NAVY.

The general admission rate for diseases and injuries in the Navy and the percentage of sick, which means the percentage of the personnel constantly disabled by reason of sickness or injury, must necessarily be used as an index of health conditions. They are the only rates, as a rule, that can be used for comparison with morbidity statistics in civil life. Of course, by analytical separation of admissions and sick days into classes it is always possible to keep track of the proportionate amounts of morbidity that are due to certain classes of disease, such as the communicable respiratory diseases, venereal diseases, etc., and to important individual causes, such as influenza. Accidents and injuries also form a group that must be watched carefully. Admission rates and time lost must be compared with figures for industries in which more or less similar hazards occur.

From a priori reasoning the general admission rate and the percentage of sick in the Navy should be low in comparison with figures for the general population and those for employees in various industries which have special accident and disease hazards. The personnel of the Navy is selected to avoid poor morbidity risks. The men are trained, worked, and exercised to maintain physical fitness. High standards of sanitation are enforced and, as shown by monthly and yearly sanitary reports, they prevail. Medical service is available at all times. First consideration, as a rule, is given to health measures and to practical methods of prevention, and all necessary provisions are made for the care of the sick and injured. Yet the figures for admissions to the sick list and numbers of days under treatment are not low.

The morbidity is not really as great as the figures indicate, but it is a difficult matter to prove that to the satisfaction of those who desire to use our figures for comparison with conditions in civil life.

With Medical Department facilities everywhere available, many men properly avail themselves of minor surgical operations or special work which in civil life would not be done, or would be postponed until it could be attended to in conjunction with something else. Also, in many instances in civil life work of this kind is done out of working hours or provided for an employee without charging an admission to the sick list and without loss of time charged to sickness, whereas in the Navy service conditions frequently make it necessary to admit a man to the sick list or even to send him to hospital, with the consequent involvement of few or many sick days. Then, too, the character of naval activities, living conditions for the crew, necessity for protecting the health of others, and the fact that there is no place for the man other than the sick bay or hospital, unless he is fully fit to perform his duties, often make it necessary or desirable to admit and carry men on the sick list who would not lose time if employed in civil life.

Nevertheless the figures are too high. Unfortunately, with comfortable beds available and a dispensary with competent and sympathetic attendants close at hand, the crew free to apply for relief at any hour of the day or night, and a medical officer on guard to detect disease early and prevent slight disability from developing into serious disability, many men are tempted to impose upon the medical department and, consciously or unconsciously, seek rest and treatment that is not really needed, when they would not think of doing so if it involved loss of pay and expense to them. It may be that Medical Department facilities are too complete and convenient and medical and nursing services too much appreciated for the best showing with regard to morbidity statistics. Certainly the addition of facilities for special service such as dentistry, roentgenology, eye, ear, nose, and throat work is always followed by so great a demand for these services that presently one wonders how it was possible previously to get along without them. The preventive value of all these things is great, and they probably pay good dividends in the way of reduction of intangible disability and promotion of health even if they do add to apparent disability as recorded by sick days. With reasonable care to avoid the unnecessary charging of sick days the profit should be revealed in statistics.

With all these considerations in mind, analysis of the morbidity statistics of the Navy still leads to the conclusion that the sickness rate is higher than it should be. Much, of course, remains to be accomplished toward the further reduction of actual disability by measures of prevention. But the figures as now recorded undoubtedly include many admissions to the sick list and a great many sick days that should not be charged up to health conditions in the Navy.

This is brought about in the several ways discussed below. The Form F card is about as complete and accurate a morbidity report as can be devised for statistical purposes, but the only person in a position to know whether the diagnosis returned by the card is correct, or whether the sick days recorded represent actual disability, is the medical officer who forwards the card. Unless the cards are incomplete or unless apparent errors in the data recorded are detected the cards must be accepted at their face value and the figures thereupon included in the vital statistics of the Navy without further question. Admission rates and sickness rates derived therefrom must be used in lieu of an absolutely true index of the health of the Navy. Statistics are necessary for this purpose, and they furnish evidence in the only form that permits of comparison. It is possible to know what the health conditions are without figures only in a small area and among a small group of people. It is unfortunate if the figures include excess disability. By that is meant admissions to the sick list not really chargeable to any conditions in the Navy affecting health but rather to the fact that the individual is not physically fit to be in the Navy, and also the accumulation of sick days that results either from not returning men to duty as soon as they are fit or not taking steps as promptly as possible to bring about the discharge from the service of those who can not be made fit.

A great deal of the excess disability can be avoided if medical officers do not lose sight of the significance of a high morbidity rate and the importance of reducing to a minimum the percentage of personnel unavailable for work or training. After all, that is the one great object of medical service as well as preventive measures and sanitation in the Navy, aside from the relief or prevention or suffering for the sake of the individual. It is the service counterpart of the endeavor in an outside industry to increase output and reduce unit costs of production.

Every applicant for enlistment who should have been rejected by the recruiting officer because of ascertainable physical or psychological defect, and was not so rejected, will almost inevitably visit the sick bay frequently and add one or several admissions to the morbidity statistics before a medical survey is held and discharge from the service is recommended.

One admission, at least, and a variable number of sick days must be charged even when the defect is so obvious that it is discovered immediately at the training station. It is not to be expected that all defects which will later prove disqualifying, after the man has been subjected to increasing degrees of stress in service, can be detected in the recruiting office, and in many cases it can not be determined that the man is a liability not justifying further observa-

tion until after he has been transferred to a cruising ship. But, procrastination and medical tinkering after all concerned, including the division officer and the executive officer if he is cognizant of the case, have satisfied themselves that the man is not fit for the service merely adds uselessly to the number of sick days already charged. If the man is not discharged without further delay the result will only be more admissions to the sick list for various causes, more sick days, and no profit to the Navy.

Not infrequently the medical officer of a ship can not decide that a man is useless, and thus not a fit subject for medical and surgical repair work, without consulting the man's division officer and obtaining such information as the chief master-at-arms and the leading petty officer of the division can furnish. Often such physical defects and disorders as are apparent constitute only one feature of the case, the underlying cause being defective intellect or emotional disorder, or a combination of both. In any case, first-hand information and knowledge of how the man has adjusted himself to the physical and mental environment and how he has responded to training and disciplinary measures is important. In case the man is transferred to hospital for further disposition a brief statement of the ascertained facts that bear upon the man's inability to adapt himself to service requirements should support the medical officer's written opinion that the man is unfit for the service.

At the hospital due weight should be given to the opinion of the medical officer who has observed the man under field or ship conditions, for, it must be remembered, in hospital the environment is very different. There the man is not subjected to the natural and unavoidable physical and mental stress that he must withstand without difficulty if he is to perform the duties of his rating in a satisfactory manner. On the contrary, everything connected with hospital service is planned to promote quick restoration to physical and mental health. Unless the medical officers who observe these subjects under hospital conditions are willing to be guided by the histories the patients have made for themselves while struggling with the naval environment under working and training conditions, they will be inclined to hold such men under treatment for gradual improvement until apparently fit for duty. In most instances the result will be more admissions to the sick list and more sick days within a short time after the man is returned to a ship or station, where he must work and take care of himself and his effects and fulfill disciplinary requirements and withstand mental stresses, all of which are either distasteful or difficult for him to do because of physical impairment or psychological inferiority that becomes manifest when he is placed in competition with his fellows. It has aptly been said

of the types under consideration that for each man of the sort the full time of two able-bodied men must be occupied to get any service out of him—his leading petty officer and a messenger.

Unless naval hospitals are careful to return to duty men who are physically and mentally fit for the naval service as soon as they are fit for duty and are equally careful to make prompt and well-advised decisions as to physical and mental unfitness they are not fulfilling the fundamental obligation of the medical department to keep as high a percentage of the naval personnel as possible constantly fit and on active duty. That means, of course, keeping the percentage of the personnel that is constantly sick as low as possible. It means prevention of disease where possible, avoidance of disability risks by proper selection in the recruiting offices and on board ship, proper selection of men for the various ratings, change in rating when indicated, prompt elimination from the service when unfitness has been demonstrated, and the quickest possible restoration to health and duty status when sickness or injury has not been avoided. Curative measures here come last on the list, but, of course, for the present, and perhaps always, the greatest work of the medical department will be to cure the sick and injured. Clinical medicine and clinical surgery must be reckoned as methods of prevention—prevention of additional, more serious, or longer disability and prevention of mortality.

The preventive value of the clinical service rendered necessarily depends in great part upon the possession by medical officers generally of a high order of professional ability and attainments and upon high standards of organization and administration of medical department activities throughout the service. But this is not enough. Unless medical officers constantly remember that the paramount duty of the medical department is to keep the percentage of the sick and disabled as small as possible at all times and the rest of the personnel as physically fit as proper activities of the medical department can assist in keeping them, a full measure of service will not be given. This paramount duty merely requires the exercise of the best judgment of which the medical officer is capable in each individual case, keeping in mind always the best interests of the Navy.

Fortunately the best interests of the patient and the best interests of the Government usually coincide in the case of a man whose value warrants his retention. There should be no unnecessary delay in the disposal of cases where value to the service is lacking, and in cases where valuable service has been rendered before disablement, when the circumstances naturally tend to make one look at the situation from the patient's viewpoint, the medical officer should not lose sight of the interests of the Government.

Standardization of methods of handling and discharging cases, in so far as practicable, is important, because standardization tends to do away with procrastination, with delay in making a diagnosis as soon as possible, delay in transferring the case when laboratory and consultation facilities are necessary and not available, delay after transfer to a hospital or other place where such facilities are available, and delay before finally holding a medical survey when discharge from the service appears advisable. Standardization lessens the effect of appeal to the medical officer's sympathy when making a decision as to the proper disposal of the case after all possible or indicated professional service has been rendered. An example is furnished by G. O. 69, which requires that men who have venereal disease in an infective stage shall not be granted liberty. Before that point was settled by requiring standard practice throughout the service it was a question to be settled for each infected individual, one after another, and appeals were constantly being made to the medical officer by men referred to him from the executive office. To-day the only question to be decided is whether the case is still communicable from a practical public-health standpoint. If it is, the medical officer so states; he does not have to weigh personal considerations and listen to special reasons, earnestly put forth, why an exception should be made in the particular case. The order, of course, makes allowance for matters of real urgency.

The question of how far it is practicable to carry standardization gradually settles itself when there is earnest desire to promote efficiency and fulfill obligations and when there is willingness to consider how other medical officers are handling debatable questions as well as a disposition to adopt procedures which have proved satisfactory and practicable elsewhere. Many details which relate to reduction in time required for diagnosis, for restoration to health, or for determination that medical survey is indicated naturally can not be covered by bureau instructions which could hardly be framed to coincide at all times with exigencies and circumstances arising under diverse conditions. Where standardization of procedure is not possible one's conscience must be the guide.

That there is need for cooperative efforts to reduce the number of sick days recorded for the Navy is shown by the morbidity statistics of the past year. There were 74,455 admissions to the sick list, a general admission rate of 609.6 per 1,000. On account of these admissions there were 1,395,543 sick days, which made an average of 11.4 days of sickness or disability for every person in the Navy. This figure is high.

Available figures pooled for various occupations in the industries of the United States indicate that the average loss of time each year through sickness and injury, all causes, is 9 days for men and 11 days

for women. The comparatively high percentage of physically unfit persons who must be kept in employment is to be borne in mind. To mention one disease alone, surveys made by the United States Public Health Service have shown that from 1 to 6 per cent of all workers examined had tuberculosis. Among 2,000 male garment workers in New York Schereschewsky found that 2.4 per cent of the operators, 3.4 per cent of the pressers, and 4.6 per cent of the finishers had tuberculosis. Four per cent of 7,000 employees of Sears, Roebuck & Co. in Chicago were found by Mock to have tuberculosis. In New York of 800 bakers examined, 57 per cent had one or more diseases and 2.4 per cent had tuberculosis; of 800 tailors, 62.7 per cent had one or more diseases and 1.6 per cent had tuberculosis; of 600 tobacco workers, 71.3 per cent had one or more diseases and 1.3 per cent had tuberculosis.

Of 20,000 workers in various industries in Cincinnati examined by Surg. D. E. Robinson, United States Public Health Service, 1.1 per cent had tuberculosis.

Official records for 1914 of the time lost on account of sickness by over 12,000 male office employees of the Federal Government in Washington showed an average of 4.8 days. On the other hand, 11.6 days per person were lost in 1913 by employees of a large railroad system in the United States. This figure approximates the Navy figure except that the exposure period occurred 10 years ago, and the Navy figure for that year was only 10.04 sick days per person. There is certainly opportunity for improvement now.

Age is an important factor in determining the frequency of sickness, and especially the number of sick days per admission. Here again, the advantage to the Navy should show in the statistics, for besides the rejection of physically defective applicants who are especially liable to sickness and disability and the constant elimination from the service of men who can not be made physically fit, the distribution of the personnel by age groups is especially favorable, the majority of all men, except recruits, being in age groups that are especially favorable to low morbidity rates. In various industries where studies have been made the number of days lost per year per person on account of sickness increases considerably among employees above the age of 50. There are relatively few in the Navy in the older age groups compared with percentages of older employees in civil life.

In this connection interesting figures are presented in report No. 5, 1920, by the British Medical Research Council, Industrial Fatigue Research Board, on fatigue and efficiency in the iron and steel industry. Statistics relating to the health of the workers covered sickness records of steel workers. All together 20,674 lives were

under observation. The data were worked through for the six years 1913-1918. For rather obvious reasons—incentive patriotism, improvement in employment, increase in wages, etc.—as in this country, there was less absenteeism on account of sickness and injury disability during war years. Therefore, the figures for 1913, which are higher than for the other years, are of the most interest. During the whole period of six years the total days of sickness incurred came to 796,730, and in addition there were 176,202 days of disablement due to injuries, making an average of 7.8 days per person per year for all causes. These figures covered only sick days for which sick benefits were paid. Sick benefits were not payable for the first three days of disablement or for disabilities lasting three days or less. However, the sick days not included in the above average represented an increase of 9 per cent to be added, making for our purposes the comparable average of 8.55 sick days for all causes, disease, and injuries, per person per year.

The total days lost from all causes showed rapid acceleration with increase of age; men of 55 to 69 were found to lose 12.3 days per year as compared with 5.4 days for men under 30. Men of 30 to 44 averaged 6.2 days, and those in the age group 45 to 54 averaged 8.5 days per year. These figures include sick days caused by uncompensated as well as compensated sickness and injury disablement. Rheumatism caused the greatest acceleration with increase of age; in men of 55 to 69 it was 6.3 times greater than in those of 16 to 29.

All sickness data (compensated disability, exclusive of disablement of less than three days' duration) were tabulated separately for 1913-14, roughly speaking, a pre-war period, and for 1915-1918, almost entirely a war period. In 1913-14 the days of disablement for all occupations among steel workers, for all causes, averaged 8.1 days per person employed per annum, and in the 1915-1918 period only 5.6 days, a diminution during the war period of 31 per cent.

The same report contains interesting comparisons with other trades and pursuits in England, which showed that the time lost on account of sickness and injuries was greater for workers in iron and steel works, to whom the figures given above relate, than for other groups. After making allowances for uncompensated sickness it was found that steel workers suffered 7 per cent more sickness than iron, steel, and quarry men and 55 per cent more than agriculturists. The figures, therefore, may be fairly used for comparison here.

In the United States six surveys were made by the Metropolitan Life Insurance Co. in various States between September, 1915, and July, 1917, covering a total of 637,000 persons holding their policies. The surveys were made in the spring in southern areas and in the

summer and fall in northern areas. Two and eight one-hundredths per cent of the people were found sick at the time. With fair random sampling, that percentage would indicate 7.6 days of sickness per person per year for the general population. The average loss of time through sickness and injury disability for each person of working age (over 15 years of age) was found to be 8.39 days, or 6.9 working days per year. The average loss by men was 8.3 days and for women 8.4.

According to the report of a special committee of the American Medical Association on social insurance presented in June, 1918, it was found by the California commission that the working days lost each year by wage earners in that State were six per worker. The Pennsylvania Health Insurance Commission found from their surveys that the average number of days of disability for males 15 years of age or over during the working years of life was eight.

A sickness survey made in Philadelphia in August and September, 1917, by nurses of the city health department, covering 12,019 persons in seven typical industrial districts, gave an average daily sickness rate of 4.28 per cent of the population, but of these only 36.7 per cent were unable to work. The daily average percentage of persons afflicted with sickness that actually disabled them was 1.57 per cent, corresponding to 5.7 days of disabling illness per person per year. Of males 15 years of age and over, 5.24 per cent were ill, and of the women 5.43 per cent. Of the men, 2.19 per cent and 1.72 per cent of the women were unable to work. It was concluded from those rates that men of wage-earning years in the districts surveyed suffer an average loss of 8 calendar days, or 6.6 working days, each year on account of disabling sickness, and women 6.3 calendar days, or 5.2 working days.

We are indebted to the Bureau of the United States Public Health Service, Division of Industrial Hygiene and Sanitation, for the 1921 statistics of the Hood Rubber Co., Watertown, Mass., covering 3,387 males and 1,774 females. Male employees lost 4.81 working days per person on account of sickness and accidents, while women employees averaged 8.94 days. These rates are for employees in a fairly new modern factory, with good working conditions, and the health of the workers safeguarded by a well-organized medical service in the plant.

HEALTH OF THE NAVY.

The vital statistics of the Navy for the month of September, in general, indicate satisfactory health conditions. The annual increase in the incidence of acute tonsillitis, acute bronchitis, and other infections of the respiratory tract has not yet begun. These dis-

eases are more or less prevalent throughout the year, but ordinarily no great increase occurs until November. The admission rate for tonsillitis and bronchitis for September was exactly the same as for the month of August—64 per 1,000 of personnel per annum.

There was no increase in the admission rate from influenza during September. Last month an increase from 11 to 15 cases per 1,000 per annum was noted. That level was maintained with a rate of 14 throughout September. This is a low rate for any season of the year—the median rate for September, 1918–1922 is 20. Thus, at present there are no indications that the disease will become epidemic in the near future. Fewer cases of influenza were reported from ships of the Battle Fleet and Scouting Fleet than in August, although admission rates continued higher among forces afloat than for personnel at shore stations. Of 42 cases reported from ships, 22 were reported by the U. S. S. *Idaho* and the U. S. S. *Arkansas*. Cases were about equally divided, in proportion to strength, between the Battle Fleet and Scouting Fleet.

Mumps were slightly less prevalent in September than during the previous month. Most of the cases occurred on board ship. Six cases were reported by the receiving ship at San Francisco. No other cases were notified from shore stations. The U. S. S. *Texas* reported 55 cases; U. S. S. *Oklahoma*, 20; and U. S. S. *Maryland*, 17. The total for the Battle Fleet was 120. Only 6 cases were reported from the Scouting Fleet. The figures for the entire Navy give an admission rate from mumps about double the expected rate for September, and last month it was noted that the August rate was 50 per cent higher than the July rate. Therefore it appears that the incidence of mumps is greater than it should be at this season of the year but that a slight reduction took place in September.

There was a slight reduction in the admission rate for German measles in September, and only one-third as many cases of measles were reported for the entire Navy as in August. In August, 24 cases were reported from ships; in September, only 2. Six cases were reported from all shore stations in the United States as compared with 13 in August. As indicated by the table below the admission rate from measles continues at a satisfactory low level.

Twelve cases of pneumonia were reported from ships for September. For the entire Navy 28 cases were reported. Five cases occurred at the naval training station, Great Lakes, Ill. That figure gives an admission rate of 18.9 per 1,000 per annum for comparison with 4.5 for the corresponding month in 1920. No cases occurred during September in 1921 or 1922. Eleven cases were accounted for by all other shore stations, including foreign and insular stations.

The whole group comprising communicable diseases transmissible by mouth and nose secretions showed a 20 per cent reduction in

the admission rate for September as compared with the rate for August—from 57.6 to 40.6 per 1,000 per annum. The September three-year median rate for this group is 31.95.

Reported cases of dengue increased from 71 to 122. Most of these (104) occurred among marines in Haiti and Santo Domingo. This disease continues to be more prevalent than in years prior to 1921 when a notable increase in the numbers of cases in the Navy occurred, followed by a greater increase in 1922.

A gratifying decrease in the incidence of malaria during September was indicated by morbidity reports received by the bureau. In September 93 cases were notified as compared with 159 in August. These figures represent a 30 per cent reduction in the admission rate, from 16.6 to 9.6 per 1,000 per annum in September as compared with August, despite advance into the malaria season. Approximately one-third of the cases occurred among marines in Haiti and Santo Domingo. As indicated by the table the admission rate for September, entire Navy, was a trifle less than half the September median rate for recent years.

Of other diseases which are usually responsible for considerable percentages of total admissions to the sick list, diseases of the digestive system were reported in slightly reduced numbers.

The admission rate for venereal diseases increased sharply in September, the increase for the entire Navy amounting to 402 cases more than were reported for August.

The admission rate for September from all diseases was 518 per 1,000 per annum as compared with 476 for August. The September three-year median rate is 541.

The September admission rate for injuries and poisoning was 76.8; the August rate, 69.2, and the September three-year median rate, 60.7 per 1,000 per annum.

This rate therefore continues higher than it should be; hence, the necessity for publicity, watchfulness, and concerted efforts to prevent carelessness.

The following table shows rates per 1,000 per annum for the principal communicable diseases, September, 1923. For comparison, corresponding median rates are given for the same month, years 1918 to 1922, inclusive:

	Septem- ber, 1918-1922.	Septem- ber, 1923.		Septem- ber, 1918-1922.	Septem- ber, 1923.
Cerebrospinal fever....	0.10	0.0	Mumps.....	9.78	18.58
Diphtheria.....	1.08	.10	Pneumonia.....	2.96	2.89
German measles.....	.27	2.27	Scarlet fever.....	.38	.10
Influenza.....	19.86	14.24	Smallpox.....	.05	.0
Malaria.....	19.86	9.60	Tuberculosis.....	3.62	1.96
Measles.....	3.43	2.17	Typhoid fever.....	.05	.21

CONVALESCENTS' SERUM AND MEASLES VIRUS IN THE IMMUNIZATION OF CHILDREN AGAINST MEASLES.

By T. W. KEMMERER, M. D.,

Bacteriologist, United States Public Health Service.

The following review of the literature on immunization against measles was presented by Doctor Kemmerer before the staff of the Hygienic Laboratory, United States Public Health Service, Washington, D. C., at a recent fortnightly meeting of the staff:

The death rate from measles is much higher than is generally supposed. Degkwitz states that the average mortality for measles, in the Children's Hospital, Munich, is 15.1 per cent, rising to 28.8 per cent in children under 2½ years of age. In Vienna from 1907-1910, more children died of measles than of scarlet fever, diphtheria, and whooping cough combined.

It is important to prevent the occurrence of the disease in children under 4 years of age, in tuberculosis, rachitic, or weak children. It is particularly difficult to prevent the spread of the disease in hospitals and other institutions for the care of young children.

The French claim that convalescents' serum was first used as a prophylactic by Nicolle and Conseil (1916). The most extensive work appears to have been done by Degkwitz, and also dates back to 1916.

Degkwitz collects the blood from convalescents, from the seventh to the fourteenth day after defervescence—preferably seventh to ninth day—as he considers the antibody content of the blood to be at its maximum during this period. The serum is collected in the usual manner, and a Wassermann test made. Phenol is added as a preservative and the serum stored in a cool place. The sera of different convalescents is mixed, as the antibody content varies with different individuals. The serum is used without filtration because the immune substance is lost to a large extent by passing through a Berkfeld filter. If the facilities for preparation of the serum are not at hand, one can withdraw blood from a convalescent and inject it directly into the exposed child. Degkwitz injects the serum intramuscularly, as do most of the other writers on the subject, although some give it subcutaneously. No deleterious results following the injection have been observed.

Degkwitz's observations are as follows:

In the case of a child under 4 years of age 2.5 c. c. of serum, administered before the fourth day of incubation, is sufficient to prevent the development of the disease, 3.5 c. c. affording complete protection. Smaller doses do not prevent the development of measles but do prolong the period of incubation and weaken the virulence of the disease. Prodromes and complications are absent, the exanthem

rather pale, and the fever of short duration. The symptoms may disappear at the end of 36 hours. Five to six cubic centimeters will afford protection up to the sixth day. If given on the seventh day the results are no longer certain. If given on the eighth day, it will not prevent the development of measles, even in doses of 30 c. c.

The usual dose employed is 3.5 to 4 c. c. for a child of $3\frac{1}{2}$ years of age, up to the fourth day of incubation.

Children receiving serum in the latter stages of incubation develop the disease in a lighter form.

The serum of children protected by injection of immune serum and who have not had symptoms of measles will protect other children against the disease.

In case convalescents' serum is not available, the serum of children who have had measles previously may be used, but Degkwitz does not make any statement as to the degree of immunity conferred.

Newborn and young infants are only immune to measles in case the mother has had measles. Eighty per cent of adults have had measles but their serum contains antibodies in small quantities only. If used it should be given in quantities of 30 c. c. With 30 c. c. of adults' serum, the infection has been prevented in 50 per cent of the cases, and the attack lightened in the other half. Frequently there is difficulty in obtaining convalescents' serum as parents are reluctant to permit the withdrawal of blood from their children. On the other hand, the parents are more than willing to permit themselves to be bled for the benefit of their children.

The duration of immunity can be determined only by observing the incidence of measles in those who have been given the prophylactic serum. Of nine exposed children who had been immunized nine months previously, two developed measles. When the serum is given late in the state of incubation and a light attack of measles follows, the immunity lasts for years. Degkwitz urges the use of prophylactic serum to postpone an attack of measles until after 6 years of age. Serum which had been kept for nine months, retained its immunizing properties.

Many other investigators have used convalescents' serum as a prophylactic against measles. They follow closely the procedure of Degkwitz, and without exception report the same favorable results. (See bibliography.)

Marie, Gastinel, and Joannon (1923) use inactivated serum.

Ruelle (1923) withdraws 4 c. c. of blood with a syringe containing 1 c. c. of a 10 per cent solution of sodium citrate and injects it intramuscularly. He says that the duration of immunity appears to be about four weeks, or about the usual duration of passive immunity.

Maggiore (1921) uses 2 c. c. of serum subcutaneously. Estella and de Castro (1922) produce a dry preparation by desiccating the serum. Marie (1922) makes the statement that, next to tuberculosis, measles causes the highest mortality of all diseases of children. Also, that Nicolle and Conseil were the first to use convalescents' serum in the prophylaxis of measles. Kutter (1921) states that in the mild cases following prophylactic injections the contagiousness is not lessened. Pfaundler (1921) says the duration of the immunity has not been determined, but lasts at least a month. The experience of Rietschel (1921) indicates that the serum of adults who have had measles contains enough antibodies to protect young children against measles, or if they contract the disease to attenuate it to a remarkable degree. He uses 20 c. c. of the parent's blood for a child 2 to 3 years of age. Torday (1921) reports three cases in which measles developed 72 to 75 days after immunization. Comby (1922) claims that the original research work was done by Nicolle and Conseil. Schilling (1923) says that there is a general agreement as to the method of Degkwitz. He tried the serum from blisters produced by cantharides, 0.2 to 0.5 c. c. on 14 children under 6 years of age. But one child did not develop measles. Herrmann (1915) says that infants under 5 months of age are relatively immune to measles. In the rare instances in which they are infected the disease appears in a mild atypical form which frequently is overlooked unless the child is under close observation. Infants under 2 months of age are absolutely immune. In countries in which the disease is not endemic, in which the mothers have not had the disease, the infants are not immune during the first five months. There is apparently no great difference in immunity between breast-fed and artificially fed infants. When infants of 6 to 7 months of age contract the disease it usually appears in a mild form, and the immunity becomes less marked toward the end of the first year; during the second year it is entirely absent. Infants under 5 months of age who have been in contact with a case of measles and have not been infected, frequently do not contract the disease. Immunity is not transferred through the milk; artificially fed infants are equally immune.

Nicolle and Conseil (1916) withdrew the blood on the seventh day of convalescence. They used 4 c. c. of serum. They say that one need not hesitate, in the same family, to use the whole blood directly, from brother to brother. Herrmann (1922 and 1923) attempted to transform the passive immunity of early infancy to an active immunity which would last at least two years. He collected the nasal discharge from patients free from other diseases, 24 to 48 hours before the appearance of the eruption and mixes it with a small quantity of physiological salt solution and centrifugalizes it to throw down bacteria and other extraneous material. If passed

through a Berkfeld filter it loses some of its potency and can not be depended upon for purposes of immunization. A few drops of the solution are applied to the nasal mucous membrane of the infant to be immunized. Only healthy infants between 4 and 5 months of age are inoculated. The best results are obtained when a reaction follows the inoculation—a slight rise in temperature on the eighth to the sixteenth day, occasionally a few spots on the face or trunk. It is therefore important to inoculate as near as possible to the end of the fifth month. In order to render the immunity more certain and lasting it would be advisable to reinoculate in the sixth or seventh month of age. He cites 165 cases without a single unfavorable result. Forty-five of these have later been directly exposed to measles without contracting the disease. None showing definite reactions have contracted disease; 36, reinoculated after an interval of at least six months, did not develop the disease.

Richardson and Connor (1919) inoculated three children with the virus of measles and at the same time gave immune serum. Two had no reaction. The third had a slight reaction indicated by a transient rise in temperature and an atypical rash.

Hiraishi and Okamoto (1921) carried out a series of experiments to determine the possibility of producing immunity by small doses of the virus as contained in the blood. They used citrated blood from measles patients, taken between the period of first appearance of Koplik's spots and the height of the eruption. They found that the minimal infective dose was between 0.001 and 0.002 c. c., 0.002 c. c. always producing the disease. The prophylactic dose of 0.0001 c. c. was entirely harmless and gives a certain degree of immunity, but does not confer absolute immunity. Their work does not appear to be extensive enough on which to base conclusions as to this method of immunization.

Degkwitz (1921) appears to have isolated an organism and grown it on media containing human serum, and with it to have produced immunity to measles. His report is very meager and apparently he is unwilling to make more definite statements until the results of his work are more conclusive.

SUMMARY.

1. Because of the high mortality of measles in young children and children affected by other diseases, it is important to prevent infection with measles until after the fourth year, preferably the sixth year, of age.

2. It appears to have been definitely determined that 3 to 4 c. c. of serum of convalescents between the seventh and fourteenth day after defervescence, injected subcutaneously or intramuscularly into a child of $3\frac{1}{2}$ years of age, before the sixth day of incubation, will

prevent the development of measles. From the eighth day on the serum, even in large doses, will not prevent the development of the disease. In older children, larger doses should be given.

In case convalescents' serum is not available, that of adults who have had measles may be used in large doses, 30 c. c., but the results are not as certain. Where the facilities for collection of serum are not available, the whole blood, fresh or citrated, may be used.

The duration of immunity following the use of convalescents' serum is at least four weeks, possibly considerably longer.

3. The attempts of Herrmann to transform the temporary immunity of infants into a permanent immunity by inoculating children under 5 months of age with the virus contained in the nasal secretions seems to have met with at least partial success.

4. The work of Hiraishi and Okamoto suggests the possibility of producing immunity by the use of small doses of virus as contained in the blood.

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**POSSIBLE VALUE OF IMMUNIZATION METHODS FOR CONTROLLING
MEASLES IN THE NAVY.**

In the United States measles epidemics tend to appear in more or less regular cycles about every third year, with intervals of two years in which the disease is not epidemic in a given locality. During epidemic periods measles is usually prevalent at or about the same time in many parts of the United States, especially in cities of the north and midwestern sections of the country.

In a measles year most of the cases in the Navy occur at naval training stations or among drafts from training stations shortly after arrival on board a cruising ship.

As a rule, the disease does not tend to spread to any great extent on board ship when proper care is taken to detect cases early, isolate them promptly, maintain concurrent disinfection, and inspect recognized contacts and known nonimmunes once or twice daily. The disease is kept from spreading principally because most of the members of the regular crew have had measles. It is often possible to avoid secondary cases.

At the training station the situation is different. A considerable proportion of the recruits are not immune. Of course, the effectiveness of the existing barrier provided by the percentage of those who are immune varies from time to time at each station. Also, a station which receives proportionately greater numbers of its recruits from large cities usually has a greater degree of protection against the spread of measles than a station which receives recruits largely from small towns and rural districts in States where the density of population is low. The value of the protection afforded by the presence of a high percentage of individuals who have had measles is not limited to the question of spread. Augmentation of virulence with a tendency to increasing severity of infection by rapid passage of the virus from one susceptible person to another as the epidemic progresses, is also an important consideration.

The infective power of measles virus is very great during epidemic periods. A high percentage of nonimmunes develop the disease when they happen to be exposed, even briefly and apparently in slight degree. The question of heightened virulence has not been settled. Moreover, opinion is not undivided among epidemiologists and research workers in laboratories as to the part played by secondary invaders. Practically, it is a matter of experience that case fatality rates are often much higher in the winter months. Bronchopneumonia at such times is a more frequent complication.

At naval training stations the measles situation during winter months is bound up with the whole question of the relations of shut-in conditions, personal contact, housing, ventilation, etc., to the entire group of respiratory infections. It is not that measles alone is prevalent. Cases of scarlet fever or diphtheria and possibly cerebrospinal fever occur from time to time. Carriers of pneumococci, haemolytic streptococci, and other microorganisms of recognized disease-producing power may be numerous. Influenza must be expected every winter. Acute bronchitis, tonsillitis, and other affections of the upper respiratory tract are always present with increased prevalence until the advent of warm weather again makes it possible to resume the open-air living conditions of the late spring, summer, and fall. Under the shut-in conditions of the winter and early spring the conditions favor the dissemination of the causative agents of these infections pretty widely among the personnel. What happens is very well expressed by the aphorism, contributed by Rosenau, as a result of his studies in the first naval district during the World War, particularly at the Commonwealth Pier, then used as the receiving ship at Boston. As he put it, under conditions of overcrowding and associated close personal contact, the bacterial flora of the nose and pharynx tends to become uniform throughout the personnel. Similar conclusions were reached independently by Mink at the naval training station, Great Lakes, Ill., from the work of Choisser and others in the wholesale culturing of recruits during epidemic periods. Medical officers at Norfolk and Hampton Roads, Va., observed a similar tendency.

Whether or not the virus of measles undergoes any marked augmentation in virulence during the progress of an epidemic, it is a matter of practical experience in the Navy that measles is a more serious disease in the winter months. Lung complications are more frequent and more serious in cold weather. Measles patients react badly to chilling and they do not withstand transportation well in cold weather. Their sensitiveness to cross infection makes it hazardous to treat them in a large group in a measles ward without rigid

bedside disinfection, so-called cubicle isolation after Chapin's technique, to prevent the transfer of microorganisms which have had their disease-producing powers intensified in passage from person to person under the indoor living conditions, and the influence of various epidemiological factors necessarily operative at the training station during cold weather.

Much, of course, depends upon whether it is a measles year outside the station, upon the prevalence of the disease in sections from which recruits are drawn, and in the adjacent communities that will be visited by liberty parties. The training station should be equipped to contend with these factors by means of its elaborate system of incoming detention and facilities for the segregation of all recruits in comparatively small groups. Of course, the administrative system will provide for the early detection of cases, immediate isolation of suspected cases as well as those which are apparent, and the quarantine of contacts when reasonable and necessary. Quarantine may be necessary beyond a doubt. The governing principle in public-health work should be to make quarantine measures as little irksome as possible. It would seem that the fact of lasting immunity after an attack of measles is sufficiently well established to justify the release from quarantine of all men who have had measles. It is another matter to determine whether or not the victim of quarantine has had the disease. The annoyance and interference with the work of the station and value of the training period may be so great from repeated quarantine of one group after another during the epidemic season as to raise the question, Why wouldn't it be practicable to question all recruits upon arrival and require those who think a certificate can be obtained to write home and ask that the physician mail a statement to the medical officer? By such procedure it might be possible to reduce the numbers of those subjected to quarantine to an extent worth while in many groups. In general, the question of quarantine will depend upon several factors—season of the year, weather conditions likely to prevail, prevalence and severity of other epidemic diseases, whether the measles cases that are occurring are sporadic and mostly unrelated to each other, size and severity of the outbreak if progressive spread is taking place on the station, and local conditions and circumstances that may to a certain extent indicate modification of control measures either in the direction of increased stringency or greater leniency.

All possible precautions are important in the winter and spring months in view of the danger of complications and high case fatality rates. Measles may become a very dangerous disease at any time during the winter. The case fatality rate in the Navy last year was

less than 1 per cent; the year before, 2 per cent. These figures are for the entire year. Case fatality rates were low during the late spring, summer, and fall in 1917 and 1918, but they rose sharply with the onset of cold weather and were generally high during the winter and early spring. At several of the larger naval stations more than 15 per cent of the cases were lost in spite of excellent care and all necessary hospital facilities of the best type. In a few instances case fatality rates mounted above 20 per cent. Pandemic influenza and the wide distribution of highly virulent and unusual types of pneumonia-causing microorganisms, of course, made the situation worse at that time than ever before in the United States.

It would be a very good thing for the Navy if a previous attack of measles could be made a condition for the acceptance of applicants for enlistment or appointment. The fleets would be spared a lot of trouble and interference with activities that are already pressed for time. In a broad sense, perhaps the most practical method of dealing with measles throughout the country would be the intelligent and carefully planned exposure of children to the disease. As a matter of fact, this is done in many families.

The guiding principles would be careful protection of children under 6 years of age at all times and the most effective application possible of all practical preventive measures in the home, in the school and elsewhere to prevent epidemics and sporadic occurrence during the winter months, followed by the intentional exposure of children of school age between the 1st of June and the 1st of October to sporadic, not epidemic, cases, provided influenza is not or has not recently been epidemic and that the spring prevalence of bronchitis, tonsillitis, and ordinary colds has subsided.

With regard to ultimate damage, it would seem that the number of sick days caused by measles and the death rate from this disease from year to year would be materially lowered if susceptible recruits could acquire measles at the training station during the summer months and have it over with at the very beginning of the naval career.

Apart from these considerations the epidemiology of measles points clearly to the necessity of preventing or postponing the disease until a favorable season of the year. The literature of experimental work on the immunization of children by means of serum from convalescent patients and by means of the virus planted on the mucous membranes, as reviewed and presented above by Doctor Kemmerer, of the United States Public Health Service, Hygienic Laboratory, is of interest in view of the possibility of extending temporary protection to young adults by similar methods. Such protection might

prove valuable in checking outbreaks and limiting the spread of measles at critical times when the type of infection is severe or tends to become severe. Also, if actual protection can be demonstrated the method should make possible a further lightening of the burden of quarantine measures which must at times be imposed at naval training stations.

THE COMMON WASH BUCKET AGAIN.

Attention has frequently been directed to the epidemiological consequences of the use on board ship of one bucket by several men in common for bathing themselves and washing their clothing and sometimes for brushing their teeth. This is a bad and even dangerous practice.

Recently two men were examined by a board of medical survey. Both were found permanently unfit for service because of impairment of vision following gonorrheal ophthalmia originating in line of duty. They were recommended for discharge from the naval service. Upon inquiry by the bureau the following information was ascertained.

Both men enlisted January 10, 1923. They were transferred from the naval training station, San Francisco, Calif., to the Battle Fleet and reported for duty on board one of the battleships at Panama, March 1, 1923, with other members of a draft transferred via the U. S. S. *Argonne*. In accordance with fleet instructions issued because of the fact that mumps and measles had been introduced on board ships of the Battle Fleet by a draft from the U. S. S. *Henderson* in December, 1922, the new men were immediately placed in quarantine to prevent them from spreading communicable disease to the rest of the crew in case such should develop among them.

There were 65 men in the draft. They were examined by a medical officer when they came on board. The draft was kept in quarantine for three weeks. While in quarantine these two men developed gonococcus infection of the conjunctiva. There was a shortage of buckets among men in the draft and groups of several men used one bucket in common. The conclusion was that infection occurred in that manner. No evidence that the infection was transmitted otherwise could be discovered. Neither man had gonorrheal urethritis.

VITAL STATISTICS.

The Monthly Health Index, which is published on the 15th of each month, contains the statistical data for individual ships and shore stations. The statistics appearing in this BULLETIN are summaries compiled from those published in the Monthly Health Index.

Annual rates, shown in the succeeding statistical table, are obtained as follows:

The total number of admissions to the sick list or the number of deaths reported during the period indicated is multiplied by $\frac{365}{x}$ or $\frac{365}{y}$ or 12, depending upon whether the period includes four or five weeks or a calendar month. The product is then multiplied by 1,000 and divided by the average complement.

E. R. STITT.

TABLE NO. 1.—*Monthly report of morbidity in United States Navy and Marine Corps for the month of September, 1923.*

	Forces afloat.	Forces ashore.	Entire Navy.	Marine Corps.
Average strength.....	74,538	41,712	116,250	20,675
All causes:				
Number of admissions.....	2,946	2,652	5,598	1,272
Annual rate per 1,000.....	474.28	762.93	577.83	639.84
Disease only:				
Number of admissions.....	2,591	2,337	4,928	1,109
Annual rate per 1,000.....	417.13	627.31	508.67	557.85
Communicable diseases, exclusive of venereal disease:				
Number of admissions.....	365	273	638	191
Annual rate per 1,000.....	58.76	78.54	53.06	96.07
Venereal disease:				
Number of admissions.....	981	426	1,407	299
Annual rate per 1,000.....	157.92	122.55	145.23	145.37
Injuries and poisons:				
Number of admissions.....	355	315	670	163
Annual rate per 1,000.....	57.15	90.62	69.16	81.99

TABLE NO. 2.—Number of admissions reported by Form F cards for certain diseases for the month of September, 1923.

	Forces afloat, Navy and ma- rines (strength) 74,538.		Forces ashore, Navy and ma- rines (strength) 41,712.		Total (strength) 116,250.	
	Number of admis- sions.	Annual rate per 1,000.	Number of admis- sions.	Annual rate per 1,000.	Number of admis- sions.	Annual rate per 1,000.
Diseases.....	2,591	417.13	2,337	672.31	4,928	508.67
Injuries and poisons.....	355	57.15	315	90.62	670	69.16
Total admissions.....	2,946	474.28	2,652	762.93	5,598	577.83
Class III:						
Appendicitis, acute.....	40	6.44	50	14.38	90	9.29
Autointoxication, intestinal.....	7	1.13	13	3.74	20	2.06
Cholangitis, acute.....	18	2.90	4	1.15	22	2.27
Cholecystitis, acute.....	0	0.00	2	.58	2	.21
Colitis, acute.....	2	.32	2	.58	4	.41
Constipation.....	18	2.90	28	8.06	46	4.75
Enteritis, acute.....	19	3.06	33	9.49	52	5.37
Gastritis, acute catarrhal.....	11	1.77	6	.86	17	1.75
Gastroenteritis.....	39	6.28	45	12.95	84	8.67
Hemorrhoids.....	24	3.86	18	5.18	42	4.34
Pharyngitis, acute.....	3	.48	18	5.18	21	2.17
Ulcer of duodenum.....	0	0.00	3	.86	3	.31
Total.....	181	29.14	222	63.86	403	41.60
Class VII:						
Varicocele.....	8	1.29	13	3.74	21	2.17
Class VIII:						
Chickenpox.....	0	0.00	1	.29	1	.10
Diphtheria.....	0	0.00	1	.29	1	.10
German measles.....	21	3.38	1	.29	22	2.27
Influenza.....	90	14.49	48	13.81	138	14.24
Measles.....	14	2.25	7	2.01	21	2.17
Mumps.....	159	25.60	21	6.04	180	18.58
Pneumonia, broncho.....	6	.97	5	1.44	11	1.14
Pneumonia, lobar.....	6	.97	11	3.16	17	1.75
Poliomyelitis, acute anterior.....	1	.16	0	0.00	1	.10
Scarlet fever.....	1	.16	0	0.00	1	.10
Total.....	298	47.98	95	27.33	393	40.57
Class IX:						
Dysentery, bacillary.....	2	.32	1	.29	3	.31
Dysentery, entamebic.....	3	.48	1	.29	4	.41
Typhoid fever.....	1	.16	1	.29	2	.21
Total.....	6	.96	3	.87	9	.93
Class X:						
Dengue.....	18	2.90	104	29.92	122	12.59
Filariasis.....			2	.58	2	.21
Malaria.....	33	5.31	60	17.26	93	9.60
Total.....	51	8.21	166	47.75	217	22.40
Class XI:						
Tuberculosis (all forms).....	10	1.61	9	2.59	19	1.96
Class XII:						
Chancroid.....	266	42.82	78	22.44	344	35.51
Gonococcus infections.....	599	96.43	242	69.62	841	86.81
Syphilis.....	116	18.67	106	30.49	222	22.91
Total.....	981	157.92	426	122.55	1,407	145.23
Class XVIII:						
Bronchitis, acute.....	102	16.42	174	50.06	276	28.49
Laryngitis, acute.....	2	.32	4	1.15	6	.62
Pleurisy, acute fibrinous.....	6	.96	3	.87	9	.93
Rhinitis, acute.....	9	1.45	6	1.73	15	1.55
Tonsillitis, acute follicular.....	216	34.77	100	28.77	316	32.62
Total.....	335	53.93	287	82.56	622	64.21
Class XX:						
Herniæ.....	22	3.54	19	5.47	41	4.23

TABLE No. 3.—*Summary of annual admission rates for venereal disease reported from ships for August and from various shore stations for the five-week period September 2 to October 6, 1923.*

	Annual rate per 1,000, August.			Average rate since July 1, 1923		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All ships.....	0	150.35	1,071.43	0	157.35	1,071.43
Battleship divisions—						
Battle Fleet.....	78.83	118.46	185.45	84.26	118.16	146.81
Scouting Fleet.....	56.29	206.69	510.25	70.06	101.69	363.36
Asiatic Fleet.....	0	402.06	628.27	97.56	616.33	1,371.43
Destroyer squadrons—						
Battle Fleet.....	0	99.15	378.95	0	96.17	378.95
Scouting Fleet.....	0	215.62	490.91	0	196.82	505.26
Asiatic Fleet.....	0	260.87	457.14	0	276.69	886.70
Miscellaneous 1—						
Battle Fleet.....	0	124.12	818.18	0	115.79	818.18
Scouting Fleet.....	0	134.29	461.64	0	138.36	400.00
Asiatic Fleet.....	0	338.82	1,071.43	11.80	338.67	1,071.43
Naval forces, Europe.....	0	195.03	524.59	0	223.50	647.06
Special service squadron (based on Panama).....	0	150.63	327.65	67.23	193.48	306.77
Naval transportation service.....	0	192.64	634.62	28.78	160.94	456.75
Special duty.....	0	41.50	500.00	0	77.55	307.69
Miscellaneous and district vessels.....	0	215.50	1,034.48	0	171.36	517.24

	Annual rate per 1,000, Sept. 2 to Oct. 6, 1923.			Average rate since July 1, 1923.		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All naval districts in the United States....	0	69.00	380.12	0	74.97	290.11
First naval district.....	0	73.94	323.56	39.74	64.94	153.85
Third naval district.....	0	144.24	240.93	7.70	83.46	137.93
Fourth naval district.....	49.68	69.23	85.19	23.94	128.81	224.97
Fifth naval district.....	0	61.13	168.42	0	77.88	124.16
Sixth naval district.....	37.08	55.98	380.12	51.91	69.26	290.11
Seventh naval district.....	0	0	0	0	0	0
Eighth naval district.....	0	71.09	87.29	21.05	45.92	51.44
Ninth naval district.....	71.04	71.04	71.04	103.68	103.68	103.68
Eleventh naval district.....	13.05	42.36	156.39	12.18	35.90	100.06
Twelfth naval district.....	19.30	74.53	155.43	21.47	66.56	124.94
Thirteenth naval district.....	21.94	78.94	148.22	24.54	103.62	221.79

TABLE No. 3.—*Summary of annual admission rates for venereal disease reported from ships for August and from various shore stations for the five-week period September 2 to October 6, 1923—Continued.*

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE.

	Per cent, August.		Per cent since July 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All ships.....	69.26	8.06	70.34	7.71
Battleship divisions—				
Battle Fleet.....	85.81	9.46	88.46	8.01
Scouting Fleet.....	62.50	5.00	71.56	4.59
Asiatic Fleet.....	41.03	20.51	41.05	13.91
Destroyer squadrons—				
Battle Fleet.....	92.86	2.38	92.77	2.41
Scouting Fleet.....	61.11	8.33	62.22	6.67
Asiatic Fleet.....	39.29	14.29	45.65	15.22
Miscellaneous ¹ —				
Battle Fleet.....	87.80	4.88	89.61	3.90
Scouting Fleet.....	62.71	16.95	65.77	13.51
Asiatic Fleet.....	41.67	16.67	40.54	21.62
Naval forces, Europe.....	71.70	5.66	65.00	6.67
Special service squadron, based on Panama.....	44.44	0	59.59	0
Naval transportation service.....	65.54	4.62	72.38	6.67
Special duty.....	68.75	0	67.57	5.41
Miscellaneous and district vessels.....	68.42	0	71.05	0

	Per cent Sept. 2, to Oct. 6, 1923.		Per cent since July 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All naval districts in the United States.....	73.80	13.37	76.67	10.90
First naval district.....	87.10	12.90	80.00	17.33
Third naval district.....	66.67	20.00	69.57	15.21
Fourth naval district.....	77.78	11.11	77.78	11.11
Fifth naval district.....	55.56	15.56	71.84	10.92
Sixth naval district.....	69.23	15.38	69.44	5.56
Seventh naval district.....	0	0	0	0
Eighth naval district.....	100.00	0	83.33	16.67
Ninth naval district.....	80.00	6.67	77.78	11.11
Eleventh naval district.....	75.00	12.50	79.31	10.34
Twelfth naval district.....	92.30	7.70	93.10	3.45
Thirteenth naval district.....	87.50	12.50	96.15	3.85

¹ Vessels of train, base, air squadrons, etc.

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TABLE NO. 4.—*Number of admissions reported by Form F cards and annual rates per 1,000, entire Navy, for the five-week period September 2 to October 6, 1923, inclusive.*

Classes.	Navy (strength 95,575).		Marine Corps (strength 20,675).		Total (strength 116,250).	
	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.	Number of admissions.	Annual rate per 1,000.
Diseases of blood.....	1	0.11	0	0	1	0.09
Diseases of circulatory system.....	39	4.24	8	4.02	47	4.20
Diseases of digestive system.....	580	63.11	137	68.91	717	64.14
Diseases of ductless glands and spleen.....	6	.65	2	1.01	8	.72
Diseases of ear.....	83	9.03	22	11.07	105	9.39
Diseases of eye and adnexa.....	80	8.71	21	10.56	101	9.04
Diseases of genitourinary system (non-venereal).....	155	16.87	22	11.07	177	15.83
Communicable diseases transmissible by oral and nasal discharges.....	381	41.46	67	33.70	448	40.08
Communicable diseases transmissible by intestinal discharges.....	10	1.09	3	1.51	13	1.16
Communicable diseases transmissible by insects and other arthropods.....	105	11.43	120	60.36	225	20.13
Tuberculosis (all forms).....	22	2.39	1	.50	23	2.06
Veneral diseases.....	1,364	148.42	289	145.37	1,653	147.88
Other diseases of infective type.....	277	30.14	86	43.26	363	32.47
Diseases of lymphatic system.....	80	8.71	20	10.06	100	8.95
Diseases of mind.....	34	3.70	14	7.04	48	4.29
Diseases of motor system.....	66	7.18	28	14.08	94	8.41
Diseases of nervous system.....	41	4.46	17	8.55	58	5.19
Diseases of respiratory system.....	861	93.69	168	84.51	1,029	92.06
Diseases of skin, hair, and nails.....	97	10.56	32	16.10	129	11.54
Hernia.....	46	5.01	2	1.01	48	4.29
Miscellaneous diseases and conditions.....	247	26.88	29	14.59	276	24.69
Parasites (fungi and certain animal parasites).....	96	10.45	19	9.56	115	10.29
Tumors.....	18	1.96	2	1.01	20	1.79
Injuries.....	663	72.14	134	67.40	797	71.30
Poisons.....	33	3.59	29	14.59	62	5.55
Total.....	5,385	585.97	1,272	639.84	6,657	595.55

TABLE NO. 5.—*Deaths reported, entire Navy, for the five-week period September 2 to October 6, 1923, inclusive.*

Cause.	Navy (strength 95,575).	Marine Corps (strength 20,675).	Total (strength 116,250.)
Malaria.....	1	0	1
Meningitis, cerebrospinal.....	1	0	1
Pneumonia, broncho.....	1	0	1
Pneumonia, lobar.....	2	0	2
Tuberculosis, chronic pulmonary.....	1	0	1
Syphilis.....	1	0	1
Other diseases.....	8	0	8
Drowning.....	9	1	10
Other accidents and injuries.....	8	1	9
Poisons.....	1	0	1
Total.....	33	2	35
Annual death rates per 1,000, all causes.....	3.59	1.01	3.13
Annual death rates per 1,000, diseases only.....	1.63	0	1.34

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VOL. XIX

NO. 6

UNITED STATES NAVAL MEDICAL BULLETIN

PUBLISHED FOR THE
INFORMATION OF THE MEDICAL
DEPARTMENT OF THE SERVICE

ISSUED BY
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
DIVISION OF PLANNING AND PUBLICATIONS
CAPTAIN D. N. CARPENTER, MEDICAL CORPS, U. S. NAVY
IN CHARGE

EDITED BY
LIEUTENANT COMMANDER W. M. KERR, MEDICAL CORPS, U. S. NAVY

DECEMBER, 1923
(MONTHLY)



Compiled and published under authority of Naval Appropriation Act
for 1924, approved January 23, 1923

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

NAVY DEPARTMENT,
Washington, March 20, 1907.

This UNITED STATES NAVAL MEDICAL BULLETIN is published by direction of the department for the timely information of the Medical and Hospital Corps of the Navy.

TRUMAN H. NEWBERRY,
Acting Secretary.

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Volume XI, No. 1, January, 1917.
Volume XI, No. 3, July, 1917.
Volume XI, No. 4, October, 1917.
Volume XII, No. 1, January, 1918.
Volume XII, No. 3, July, 1918.
Volume XIX, No. 1, July, 1923.

SUBSCRIPTION PRICE OF THE BULLETIN.

Subscriptions should be sent to Superintendent of Documents, Government Printing Office, Washington, D. C.

Yearly subscription, beginning January 1, \$1.50; for foreign subscription add \$1.00 for postage.

Single numbers, domestic, 15 cents; foreign, 24 cents, which includes foreign postage.

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PREFACE.

The UNITED STATES NAVAL MEDICAL BULLETIN was first issued in April, 1907, as a means of supplying medical officers of the United States Navy with information regarding the advances which are continually being made in the medical sciences, and as a medium for the publication of accounts of special researches, observations, or experiences of individual medical officers.

It is the aim of the Bureau of Medicine and Surgery to furnish in each issue special articles relating to naval medicine, descriptions of suggested devices, clinical notes on interesting cases, abstracts of current medical literature of special professional interests to the naval medical officer, reports from various sources, historical essays, notes and comments on topics of medical interest, and reviews or notices of the latest published medical books.

The bureau extends an invitation to all medical officers to prepare and forward, with a view to publication, contributions on subjects of interest to naval medical officers.

In order that each service contributor may receive due credit for his efforts in preparing matter for the BULLETIN of distinct originality and special merit, the Surgeon General of the Navy will send a letter of commendation to authors of papers of conspicuous merit and will recommend that copies of such letters be made a part of the official record of the officers concerned.

The bureau does not necessarily undertake to indorse all views or opinions which may be expressed in the pages of this publication.

E. R. STITT,
Surgeon General United States Navy.

v

NOTICE TO SERVICE CONTRIBUTORS.

When contributions are typewritten, *double spacing* and wide margins are desirable. Fasteners which can not be removed without tearing the paper are an abomination. A large proportion of the articles submitted have an official form, such as letterheads, numbered paragraphs, and needless spacing between paragraphs, all of which require correction before going to press. The BULLETIN endeavors to follow a uniform style in headings and captions, and the editor can be spared much time and trouble and unnecessary errors can be obviated if authors will follow in the above particulars the practice of recent issues.

The greatest accuracy and fullness should be employed in all citations, as it has sometimes been necessary to decline articles otherwise desirable because it was impossible for the editor to understand or verify references, quotations, etc. The frequency of gross errors in orthography in many contributions is conclusive evidence that authors often fail to read over their manuscripts after they have been typewritten.

Contributions must be received two months prior to the date of the issue for which they are intended.

The editor is not responsible for the safe return of manuscripts and pictures. All materials supplied for illustrations, if not original, should be accompanied by a reference to the source and a statement as to whether or not reproduction has been authorized.

Only the names of actual reviewers for a current number appear.

The BULLETIN intends to print *only original articles, translations, in whole or in part, reviews, and reports and notices of Government or departmental activities, official announcements, etc.* All original contributions are accepted on the assumption that they have not appeared previously and are not to be reprinted elsewhere without an understanding to that effect.

U. S. NAVAL MEDICAL BULLETIN

Vol. XIX.

DECEMBER, 1923

No. 6

SPECIAL ARTICLES.

SOME OF THE FUNCTIONS OF THE NAVAL MEDICAL PERSONNEL SERVING IN THE FIELD, WITH SPECIAL REFERENCE TO FIELD SANITARY MEASURES.¹

By W. L. Mann, Lieutenant Commander, Medical Corps, United States Navy.

FIELD HYGIENE AND SANITATION.

Value of field hygiene.—One of the prime requisites for victory is health. "Health is necessary in war, and can not be replaced by anything else."

An army in order to fight has literally and figuratively "to take the field," consequently field hygiene and sanitation is one of the most important subjects for military sanitarians, as, at this time, the laws of preventive medicine are made applicable to war, and this adaptability to war-time conditions is the supreme test of all military efficiency.

The functions of a medical military organization may be roughly divided into (a) prevention of disease and (b) treatment of disease. Prevention of disease is of vast importance to the military personnel, and this function only will be considered in this paper.

The comparison of the mortality rate in modern armies with the following figures graphically demonstrates the recent advance of field sanitation:

	Died from disease.	Killed by the enemy.
Walcheren expedition.....per cent..	34	1.6
Allies in the Crimean War.....	50,000	2,000
Civil War (Federal forces).....	186,000	44,000
In the Spanish-American War.....	3,000	345
German casualties to Jan. 31, 1917.....	59,213	929,116

To a well-informed person the laws of field sanitation may appear so elementary that a study of them would seem unnecessary and probably a waste of time. But when one stops to consider, for example,

¹Prepared for the naval medical officers' correspondence course, 1922-23, Marine Corps Schools, Marine Barracks, Quantico, Va.

that the simple measures of mosquito control alone made the building of the Panama Canal possible, one may obtain a slight idea of the vast economic importance of such a preventive procedure. Also, it is not improbable that the World War would have terminated by reason of epidemic diseases in the second year had not certain apparently simple sanitary measures been observed.

The simple method of exterminating the body louse undoubtedly saved hundreds of thousands from death by typhus during the late war.

Still further, should 1,000,000 "trained citizenry spring to arms," we should expect that no less than 100,000 would soon be incapacitated for duty with preventable foot injuries unless the responsible authorities give detailed attention to shoe fitting and foot care.

Qualifications of a successful sanitarian.—Tact and a certain amount of technical ability are necessary requirements for a successful sanitarian. Sanitation is so closely interrelated with cleanliness that you will find that the major portion of the duty of a sanitary officer consists in the supervision of the cleanliness of others.

To cause efficiently other individuals to maintain their persons and premises in a clean condition without arousing a certain amount of friction and antagonism is not always an easy matter, hence the *modus operandi* should vary with the circumstances. As a rule you will find that friction is exceedingly rare and that there is complete cooperation of the combatant forces in enforcing all necessary sanitary recommendations.

However, if cooperation is not as prompt as you may wish, do not quibble over details, but cultivate a receptive attitude and remember that some of the functions of the sanitary officer are considered purely advisory in nature, and that here his responsibility may cease.

As a general rule reduce all sanitary recommendations to a minimum and make them as concise as possible. All recommendations should be carefully considered, and those which are not of essential importance should be omitted. If practicable, preface your recommendations with an explanation, as commanding officers as a rule like to know the why and wherefore, and rightly so.

Preventive medicine is not an exact science nor is it possible to obtain 100 per cent efficiency. However, if by watching the minor details we are able to increase military efficiency from 96 per cent to 98 per cent, we have not gained a mere increase of 2 per cent as it may seem, but have effected a gain of 50 per cent—that is, we have reduced the noneffective note from 4 per cent to 2 per cent. It is this little difference which sometimes may cause the balance to vary between victory and defeat.

Field sanitation contrasted with sanitation of garrisons.—The difference between field sanitation and sanitation of garrisons is marked.

(a) Field sanitation is easier to institute.

For example: The devices used for the disposal of waste in the field are of simple construction, whereas the installation of a water-carriage sewerage system requires expert engineering knowledge.

(b) Constant attention is required to maintain field sanitary devices in proper sanitary condition.

In garrison life the running water and the water-carriage sewerage system usually and automatically maintain themselves in a sanitary condition, with relatively little worry or attention from the sanitary officer. Whereas in field sanitation the conditions are such that the field sanitary devices require constant, alert, and daily personal attention from both the line and medical officers in order that there may not be a weak link in the chain of sanitary measures.

Barracks life may give us comparatively little concern, but when we take the field vigorous sanitary methods must be instituted and maintained and, if possible, improved upon from day to day.

Sanitation versus congregation.—Almost without exception, it is characteristic of all animal life to show a gregarious tendency. And as this gregarious tendency increases, nature attempts to limit excessive multiplication by the reaction of infectious or autogenous toxic products upon the mass. According to mathematics, any species, increasing as it does by geometrical progress, would in a short period of time, relatively speaking, tend to inhabit the earth to the exclusion of all other species.

The danger of infection is in direct ratio to the size and degree of density of the aggregation. Imagine, for example, that a number of men take the field and make no attempt to enforce the laws of sanitation, then the possibility of infection of the various organizations would vary, approximately, directly according to the number and concentration of men. In other words, under conditions in which the measures of preventive medicine were not employed the possibility of an individual soldier acquiring an infectious disease in an army of 1,000,000 men would be approximately one thousand times greater than in a regiment of 1,000 men acting independently. Various other factors enter into consideration that tend to render these statements not mathematically exact; however, they are sufficiently accurate to serve for the purpose of illustration.

The greater the crowding the greater will be the possibility of infection and therefore the greater will be the need of sanitary measures. But man, by gradual attainment, study, and application of the laws of hygiene, has reached a stage in his development in which he is able to assemble a million men in the field and defy nature in her attempt at decimation by disease. It is interesting to note that this

achievement has been consummated only in the past few years. As an example, compare the mortality rates from disease during the Civil and Spanish-American Wars to the late war.

Who is responsible for proper maintenance of sanitation?—The commanding officer of an organization is responsible for the health of his command and the enforcement of sanitary measures. The medical department frequently acts only in an advisory capacity. The medical officer is charged with the initiative in making necessary recommendations to the commanding officer tending to the promotion of health and prevention of disease. For instance, the medical officer should recommend the type and number of sanitary devices, but the responsibility for the actual construction of them and the maintenance of the same in a sanitary condition rests with the respective unit commander. Likewise, the sanitary company of the medical battalion exercises supervision over sanitation, but the latrines, urinals, incinerators, etc., should be constructed by a detail from other units.

Much of the following data have been compiled from various textbooks and from the course of instruction on field hygiene and sanitation at the Medical Field Service School, United States Army, Carlisle Barracks, Pa. Other ideas were worked out by the writer during the past five years while serving at the marine barracks, Quantico, Va., and later with the gendarmerie d'Haiti.

CONSERVANCY, OR THE DISPOSAL OF WASTE PRODUCTS IN THE CAMP AND IN THE FIELD.

Waste products may be divided as follows:

1. Refuse:

- (a) Garbage.
- (b) Rubbish (boxes, paper, etc.).

2. Excreta:

- (a) Night soil (urine and feces).
- (b) Manure (stable litter).

Or they may be classified as follows:

1. Solids:

- (a) Human feces.
- (b) Kitchen garbage.
- (c) General camp refuse.
- (d) Stable refuse.

2. Liquids:

- (a) Urine.
- (b) Kitchen sullage.
- (c) Ablution water.

The proper disposal of waste constitutes one of the most important functions of the field sanitarian.

In the disposal of waste the following objects should be kept in view:

1. Prevention of insect breeding. To change the nature or location of waste matter so that fly breeding will be prevented, and also the breeding of other disease-carrying insects.

2. Destruction of microorganisms. To destroy or otherwise eliminate the presence of pathogenic organisms.

3. Removal of a nuisance. Waste matter and filth are almost synonymous terms; and, as such, the accumulation of waste creates a condition which is offensive to the sense of sight and smell.

Collection and disposal of refuse.—Metal garbage cans, if available, should be placed at intervals in the company streets for the deposit of waste paper, burnt matches, cigarette stumps, fruit peelings, etc. The use of receptacles of this nature accomplishes primary cleanliness of the camp and inculcates the habit of cleanliness in the men. If metal receptacles are not available, wooden or cardboard boxes may be employed.

Garbage cans should be well covered and placed on raised platforms at least 2 feet from the ground. The soil beneath these platforms is easily contaminated by the overflow of drippings, and requires careful supervision to prevent pollution and fly breeding. The surface beneath garbage cans should be scraped daily and shoveled into the garbage cans. Fresh, dry earth should then be spread over the scraped area. The promiscuous use of lime to cover filth is not recommended.

The ultimate disposal of waste is confined to two procedures, viz, burial or burning.

Burial was the earliest means of disposal and is instinctive in many of the lower animals. Moses in his advice to the Israelites, in Deuteronomy xxii, 12, 13, says, "Thou shalt have a place also without the camp, whither thou shalt go forth abroad; and thou shalt have a paddle upon thy weapon; and it shall be, when thou wilt ease thyself abroad, thou shalt dig therewith and shalt turn back and cover that which cometh from thee."

In camps not of a permanent nature and with moving troops, burial is the more convenient and rapid means of waste disposal and is universally practiced in our modern armies. Incineration has the advantage of complete destruction of all waste and is the better method, from a sanitary viewpoint, for permanent camps.

Latrines.—On the march: A marching column is supposed to rest for 10 minutes every hour of the march, and during the rest periods the medical officer should see that some place is provided for the men to relieve themselves. As soon as the column halts, a sanitary detail from the company should immediately proceed to improvise latrines. A few narrow trenches about 8 inches deep and 1 foot

wide will suffice. These may be hastily constructed with a sharp stick, spade, or bayonet. The sanitary detail should remain to fill in the latrines when the march is again resumed. An important point to remember is that bacteria which disintegrate the urine and the feces are found in the upper layers (the upper few inches) of the soil, and for this reason superficial latrines permit a more rapid sterilization of the dejecta than the deep latrines.

In temporary camps: Camps which are to be occupied for 15 days should have straddle trench latrines with dimensions as follows: 1 foot wide, 2 feet or less deep, 3 feet long.

Straddle trench latrines should be constructed parallel to each other and should be 3 feet apart; the loose earth should be heaped close to one end of the trench. A shovel, spade, tin, or other similar article should be on hand, and each man using the latrine should be required to cover up his dejecta with loose earth after defecation.

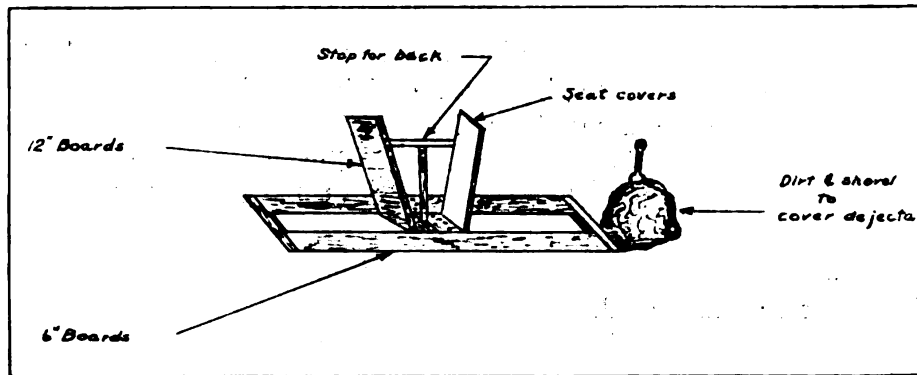


FIG. 1.—“Back to back” modification of cover for a straddle trench. This cover converts the open latrine into a closed type. Useful in camps of several days or weeks of occupancy.

The straddle trench latrine may be designated the open shallow latrine.

The “back to back” cover may be used to convert this type into the closed type of latrine.

The open deep latrine similar to those used during the Spanish-American War, and which gave so much trouble, will be omitted from discussion.

In semipermanent and permanent camps, deep covered latrines should be used. These latrines require more time and labor to construct than the shallow-trench latrines, but have the advantage that they are easier to make fly proof.

The dimensions for deep latrines vary considerably, but the following may be taken as a standard: 2 feet wide, 6 feet deep, $7\frac{1}{2}$ feet long.

In loose soil it may be necessary torevet the latrine pit.

The Havard box is an excellent type of cover for deep latrines. The exact specifications for building this box will be found in textbooks on this subject. The box consists essentially of an inverted open box built to a convenient height above the ground, containing pear-shaped holes in the top, with lids covering these holes. The lids are made so as to open not over 85° , which will cause them to close automatically. A space of one-fourth inch should be left at the seat hinge to allow for the swelling of the wood.

The accompanying illustration may be consulted for the plans and specifications of the standard latrine box and inclosure used by the Quartermaster Corps, United States Army.

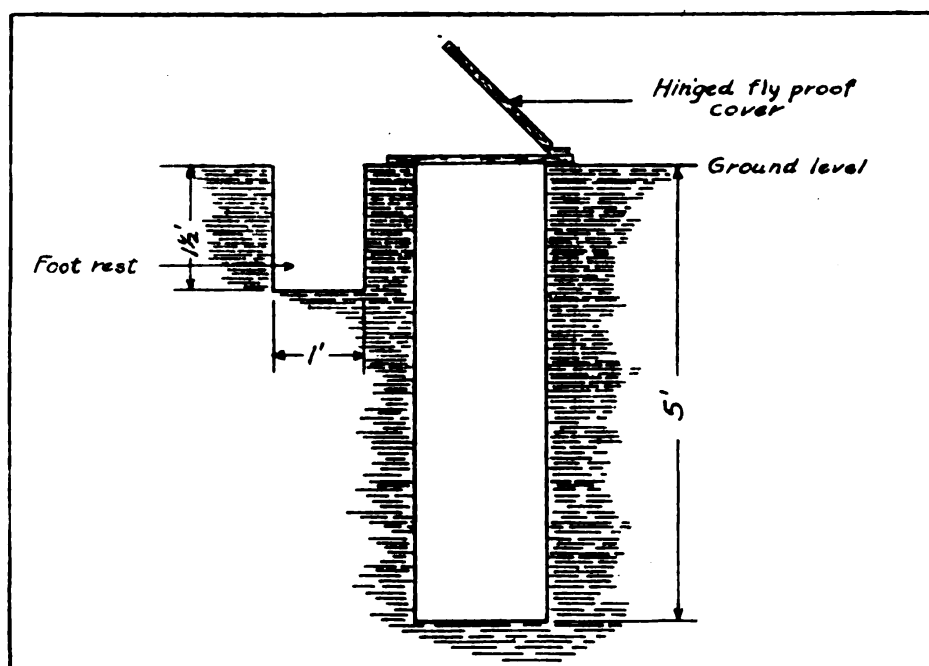


FIG. 2.—Covered pit latrine level with the ground.

These deep latrines are usually intended for use over a long period of time. Most of the odors of latrines are due to ammoniacal and other decomposition of urine. The separator system is sometimes used to separate the urine from the feces. A urinal soakage pit is built close by, and by means of a tin gutter, built in front of and under the seat, the urine accompanying defecation is drained into the soakage pit.

Site and number of latrines.—Latrines should (a) be constructed at least 100 feet from the camp. Deep closed latrines may be constructed at a distance of 50 feet. (b) They should be constructed on the opposite side of the galley and kitchen, and (c) if practicable, located so as to drain away from the water supply. (d) They should be placed at a safe distance from ditches and gulleys so as to

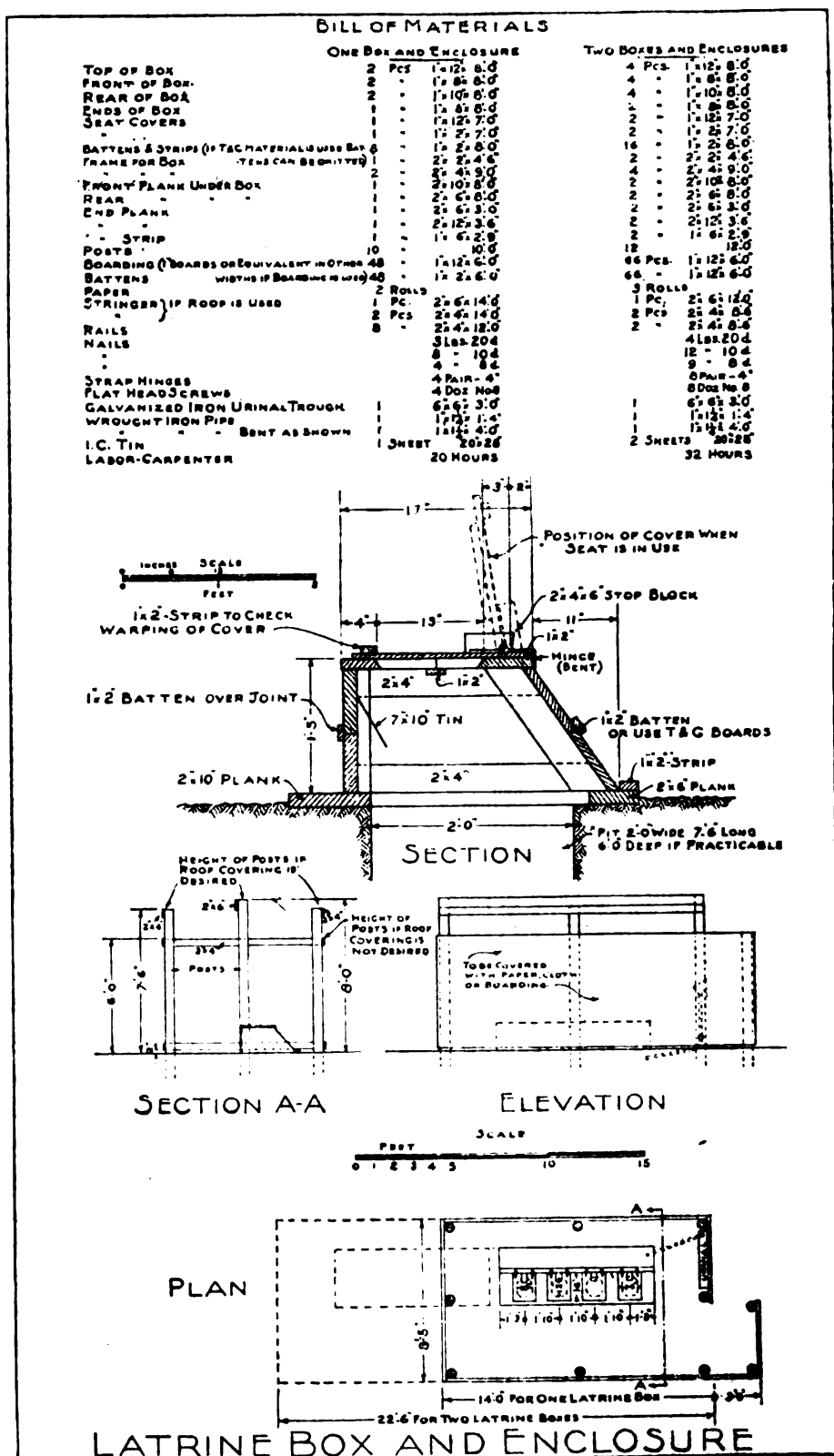


FIG. 3.—Latrine box and enclosure. From "Manual for the Quartermaster Corps, 1916."

avoid the overflow which might be caused by a heavy rainfall. (e) Separate latrines should be constructed for officers and men.

The seating capacity of the latrine area, as given by various authorities, ranges from 5 to 15 per cent of the command, depending upon the conditions. For commands on the march, stopping for only one night in camp and breaking camp shortly after breakfast, a latrine frontage of 1 yard for every 10 men is not an excessive allowance. It is not always practical to construct this number, and under such circumstances the medical officer should be satisfied with a 6 to

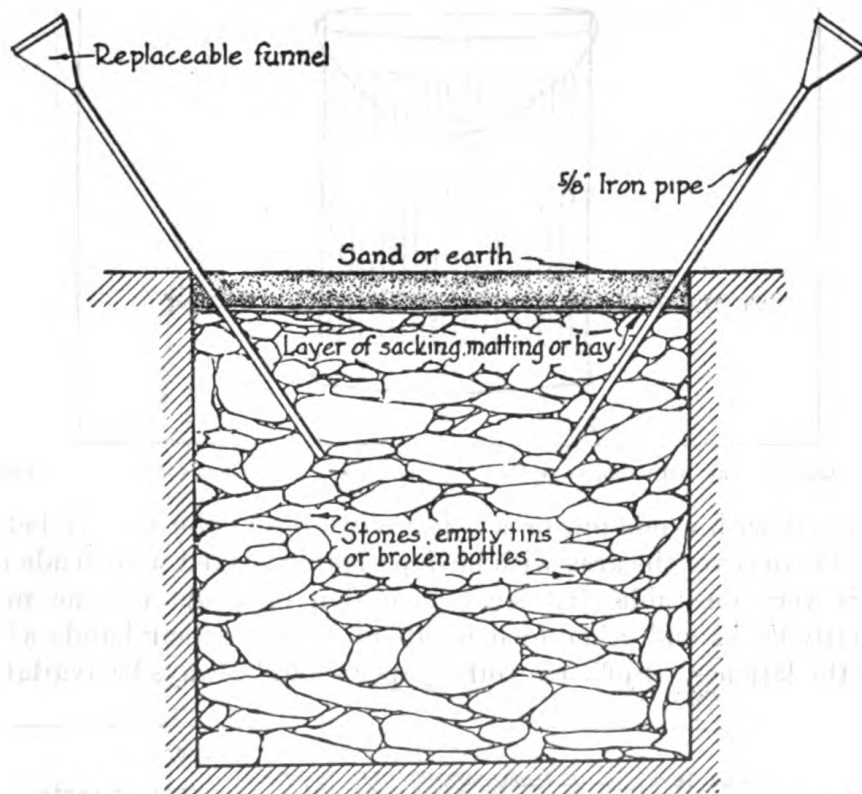


FIG. 4.—Urine soakage pit, cross section. From "Sanitation in War," by P. S. Lelean, P. Blakiston's Son and Company, Philadelphia.

8 per cent frontage, using the latter figure for commands under 500. In a semipermanent camp estimate one seat for every 15 men.

Care of the latrines—When deep latrines are filled to within 3 feet of the surface with excreta, they should be filled in with earth and abandoned. The filled-in latrines should be covered with a mound of earth and labeled with an "L" if practicable. This marking of the latrines serves to inform future occupants of the site of the location of abandoned latrines.

The inside of deep trench latrines should be darkened by the use of tar paper, lampblack or other suitable material. The use of a dark substance will prevent the entrance of ova-depositing flies. This depends upon the principle that flies as a rule tend to avoid dark places.

The box cover may be removed occasionally and the inside burned out with kerosene or crude oil.

In order to prevent the egress of any fly larvæ which may develop in the depth of the latrine and burrow through the ground around the mouth of the pit, an area of about 4 feet around the pit should

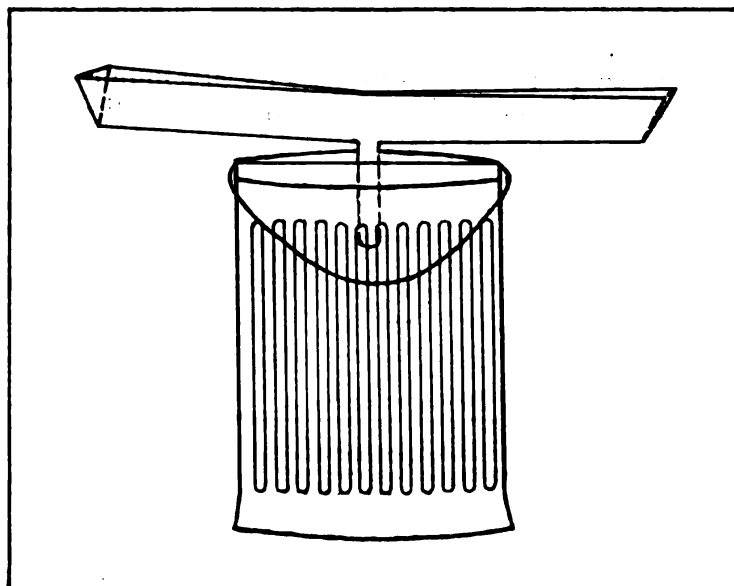


FIG. 5.—Garbage can with top, converted into portable night urinal for company streets.

be covered with crude oil, or a 5 per cent cresol solution. A better method is to cover the area with burlap sacking soaked with crude oil.

It is very desirable that some provision be made for the men, especially cooks and other food handlers, to wash their hands after using the latrines. Sufficient toilet paper should always be available.

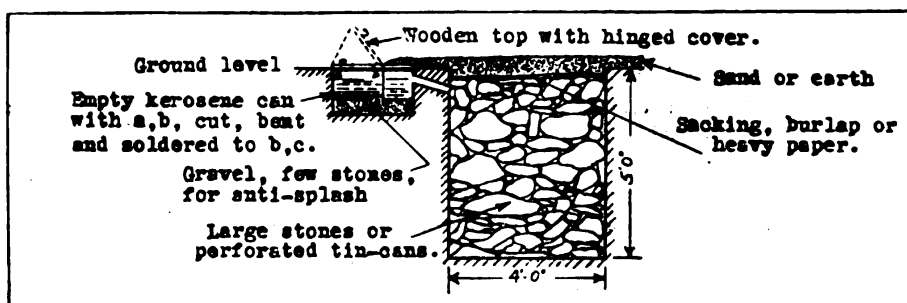


FIG. 6.—Cross section of soakage pit for waste water with grease and soap trap.

In order to prevent the possible flooding of latrines by storm water, a shallow trench should be dug around the area occupied by the latrine.

Latrines should be surrounded by a canvas latrine screen or a screen made of shrubbery.

Soakage pits.—Soakage pits are intended for the disposal of liquid wastes, kitchen sullage, and ablution water. They are especially useful in camps of a permanent nature. These pits function most satisfactorily and should be utilized wherever possible.

In a porous soil a urinal soakage pit will dispose of the urine of 100 to 200 men for an indefinite period of time.

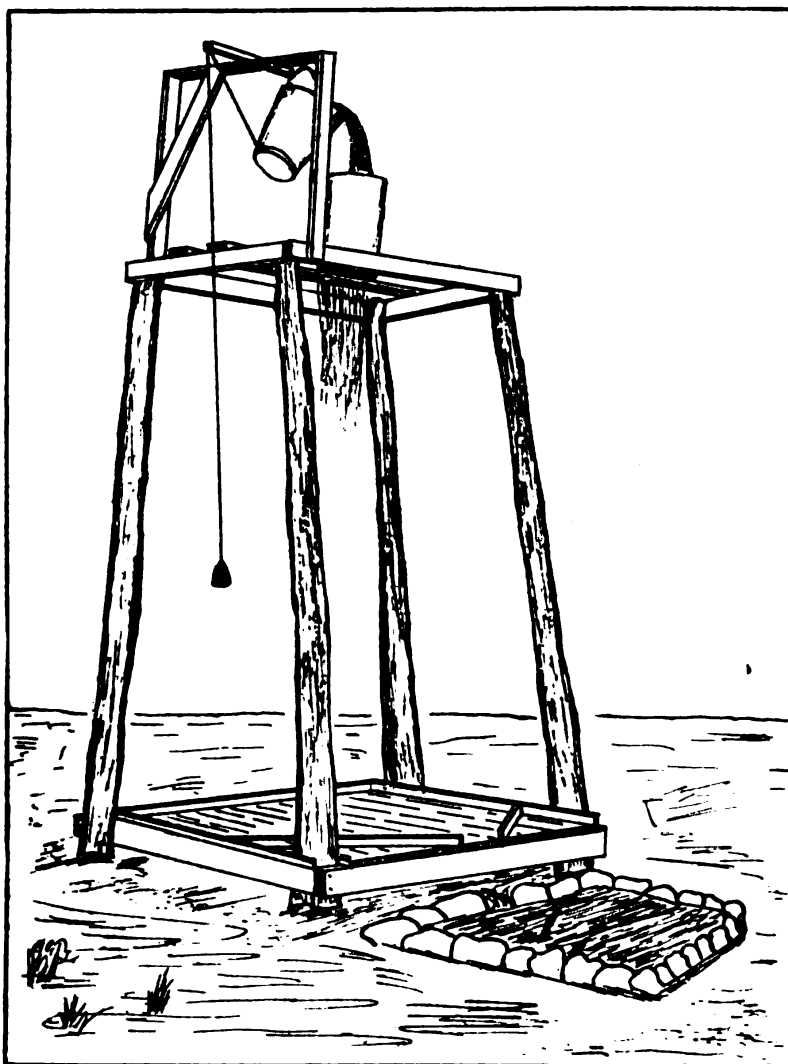


FIG. 7.—Improvised field shower bath, soakage pit, and soap trap for waste water.

Soakage pits are very simple and easy to construct.

The dimensions of soakage pits should be 4 feet square and 4 feet deep.

Urinal soakage pits: The urinal soakage pit is constructed as follows: Dig a pit 4 feet square and 4 feet deep, fill up to within 6 inches from the surface with large stones, or empty perforated

tin cans, and insert four pieces of iron pipe $4\frac{1}{2}$ feet long, one at each corner. Cover stones with oil-soaked burlap sacking, and fill the rest of the pit with earth. Tin funnels are fitted into the ends of the iron pipes. In the absence of iron piping or funnels, these can be improvised from empty kerosene cans, or tar paper may be used for the purpose.

Sullage pit: Dimensions of this pit are the same as for the urinal soakage pit, they are also built the same, except they are fitted with grease traps to remove the grease which would tend to clog the soakage pit.

Ablution pit: Pits for ablution water are built similar to sullage pits, except that they are fitted with soap traps.

See illustration for a combined grease and soap trap. Water run through a box of sand will suffice to remove the soap.

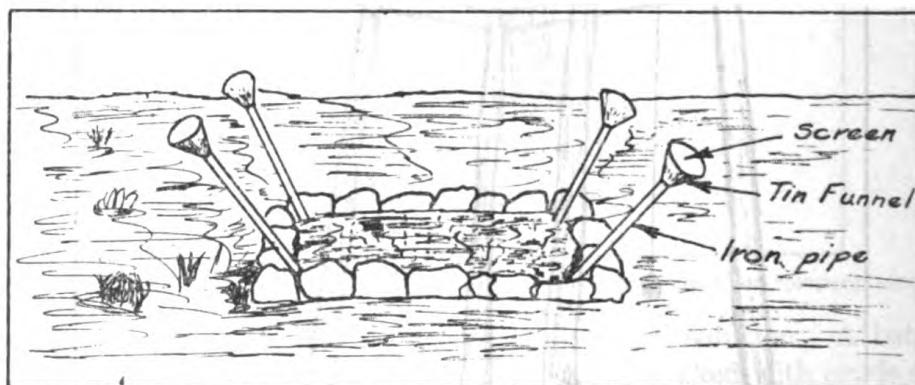


FIG. 8.—Modified urinal soakage pit with replaceable tin funnels. (Note: The pit is surrounded by white-washed stones to make the area more visible at night.)

Night urinals.—If the urinals are placed at some distance from the camp, it is a temptation for a man wishing to relieve his bladder during the night to urinate on the ground in the vicinity of his tent. To overcome this tendency, urinal cans should be placed in the company streets at night, with a lighted lantern to mark the location.

The cans which are used for urinals should be cleaned and sunned during the day.

Figure 8 illustrates an ordinary garbage can converted into a urinal for this purpose.

It is sometimes possible to dispose of the kitchen refuse by contract with the farmers in the vicinity to haul it away to use as food for hogs, poultry, etc. This method of removal is satisfactory at times, but at other times it will be found difficult to compel the farmers to remove the garbage at regular intervals, thus allowing the waste to accumulate and become a nuisance. Under these circumstances it is frequently advisable to resort to other means of

disposal and to bury or burn the kitchen garbage together with the other waste products.

Incineration.—In order to illustrate the fact that the proper disposal of garbage for large bodies of troops is sometimes a much more difficult procedure than it would appear, this occasion is taken to relate a personal experience with this matter.

While the writer was serving as post surgeon at the marine barracks, Quantico, Va., one of the problems encountered, prior to the construction of the water-carriage sewer system, was the disposal of several thousand gallons of semiliquid excremental and other waste products per day. At first an effort was made to dispose of this matter, from the camp of about 3,000 men, by means of burial, but here the soil was clay and of a limited degree of porosity, which caused the pits to fill up more rapidly than a dozen laborers were able to dig them. Later various types of incinerators were tried out but they all proved rather unsatisfactory for the cremation of such a large mass. The attempt to solve this problem by dumping the garbage and excreta in the Potomac River eventually turned out to be even more unsatisfactory and insanitary, as the 40-inch tide caused the beaches in the vicinity to be littered with this refuse. (There was a low degree of salinity of the water, and this, together with the agitation, tended to prevent rapid disintegration of the organic matter.)

Finally, the "hillside" method of incineration was devised and proved simple and satisfactory. The hillside method of incineration was described by the writer in the *Journal of the American Medical Association*, April 6, 1918, from which the following is quoted:

"This method of garbage destruction consisted of a series of six parallel natural ravines located on the south side of a 15-foot bluff which had a declination of from 50° to 60°. Two of the ravines were used each day, one for the kitchen and one for the excremental refuse. The garbage wagon drove up to the end of the bluff and dumped the refuse on a small pile of brushwood, which acted as a strainer to retain the solids, allowing the liquid to be partly absorbed while the excess drained downward and was collected immediately beneath the brushwood in a series of small pools 2 or 3 feet in diameter.

"These pools were increased in size and number as the necessity demanded. The fire was started below the lowest collection of liquid and was then gradually built upward. It was found that the lowest collection of liquid received the maximum heat, being nearest the fire, and tended to evaporate first.

"Consequently, after from one to two hours it was possible to pile fuel upward gradually and to completely consume the dry and semi-

carbonized matter remaining at the upper portion of the ravine leaving the soil hard, dry, and sterile. At the close of each day these ravines were easily cleaned by raking the débris downward, using the tin cans and ashes to fill up small swamps.

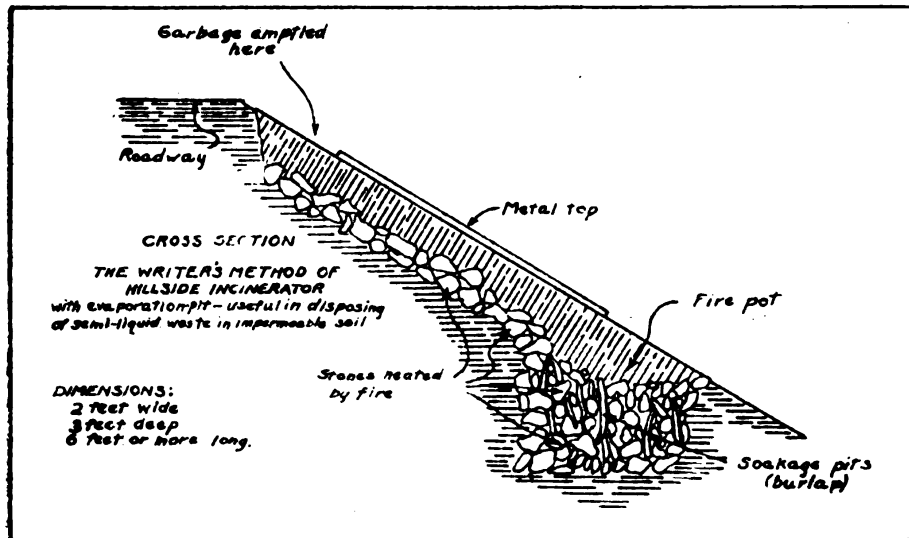


FIG. 9.—Hillside incinerator.

“Subsequent information on the subject shows that this method of incineration is somewhat similar in principle to the inclined-plane incinerators described by Lelean in his ‘Sanitation in War.’ As the heat penetrates only 2 or 3 inches of the soil, a portion of the

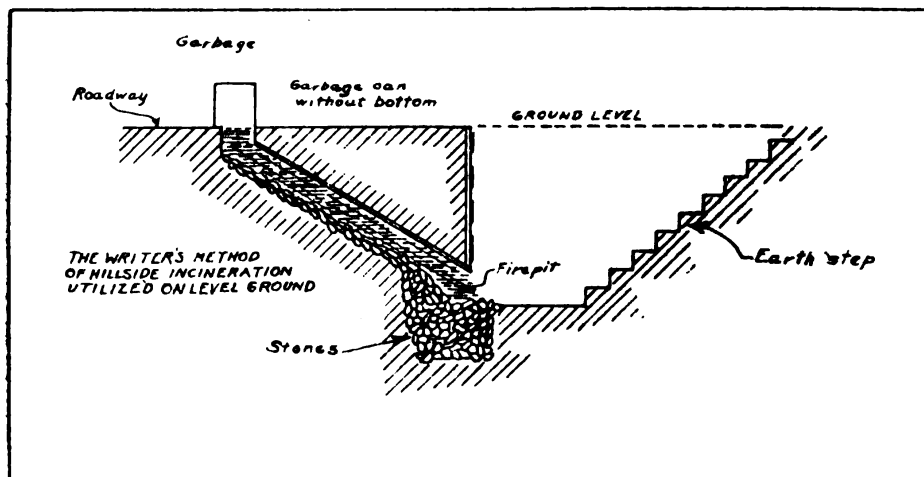


FIG. 10. Method of hillside incineration utilized on level ground.

infected fluid may escape this sterilizing action of the heat. This, however, depends upon the permeability of the soil and the rapidity with which the fire is built upward.”

This mode of disposal has the following advantages:

1. **Simplicity.** One unskilled laborer effectively and efficiently disposed of the excremental and garbage refuse of 3,000 persons.
2. **Availability.** Almost every terrain contains a sloping hillside or a small embankment that may be utilized.
3. It requires a minimum amount of fuel, as the fire is *below* and the heated air rises and comes in direct contact with the liquid and semisolids.

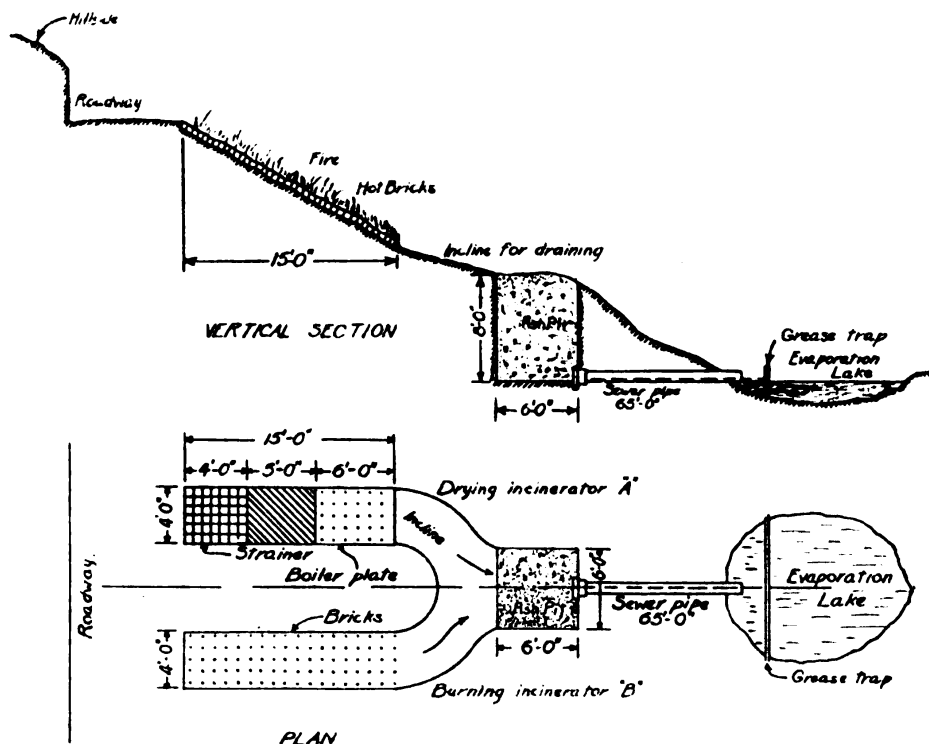


FIG. 11.—The writer's method of hillside incineration for semipermanent camps. The incinerators are built on the side of a hill with a slope of about 45 degrees, the garbage emptied on strainers in incinerator A. After drying the solids are shoveled into incinerator B and burned. The liquids run to the bottom of the incinerator and are partly evaporated by the hot bricks. They then percolate through 9 feet of ashes, and are conducted through sewer pipe to lake.

4. The square area of the surface of the fluid which is exposed to the heat is greatly increased because of the earth's absorption, and this facilitates rapid evaporation.

Illustrations 9 and 10 represent modifications of the original idea of hillside incineration.

The hillside incinerator probably will prove more useful if there is a large mass of semiliquid refuse to dispose of, as under such conditions where pit latrines are not practicable.

With a small body of troops in the field, such as a company or a battalion, one of the following types may prove equally as serviceable.

Caldwell incinerator: This is the name applied to two trenches dug at right angles to each other, intersected in the center. The dimensions are, length, 6 feet; width, 1 foot; depth, at the center, 1 foot. There is a gradual slope upward from the center to the surface at either end. A chimney is improvised at the center by using a barrel and covering its sides with clay; scrap iron may be utilized for building a grate and stones for lining the sides of the trenches. The wooden barrel is burnt out, leaving a clay chimney. A garbage can with large perforations in the bottom may be used as a substitute for the barrel and clay.

Rock-pile incinerator: Dig a circular pit 15 feet in diameter and 3 feet deep; line the pit with boulders or mashed tin cans. In the center of the pit raise a pyramid of stones about 5 feet high which will serve to create a draft. A fire is built around the pyramid of stones and

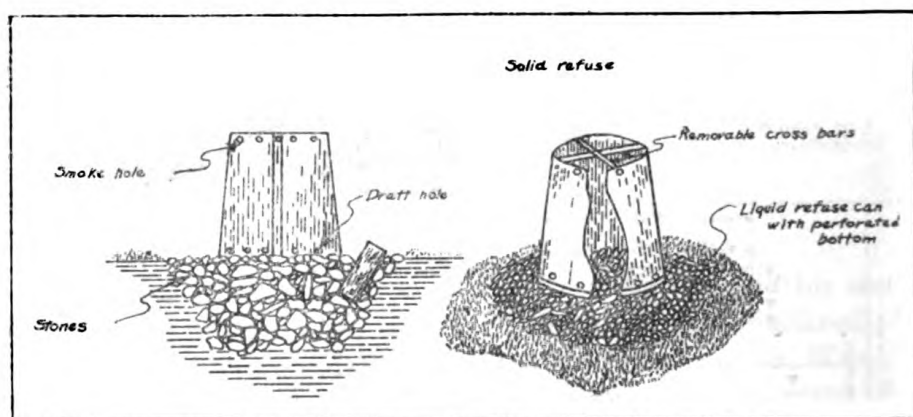


FIG. 12.—Ferguson Incinerator.

the garbage is later thrown on the pyramid, where the solid matter is consumed and the liquid is evaporated by the hot stones.

See illustrations for specifications for rock-pile incinerator.

One cord of wood will consume about 4,000 pounds of ordinary camp refuse, after the stones have been heated.

Ferguson incinerator: See illustration.

Disposal of manure.—Horse litter may be used as fertilizer, or it may be burned.

Used as a fertilizer by (a) distribution: This method is applicable only in warm weather. The manure is spread in a thin layer on hard level ground, care being taken not to have the layer more than 1 inch in thickness. It is raked over a few hours later and all small lumps broken up. This rapid drying method prevents fly breeding.

(b) Close packing (biothermic method): In this method the manure is moistened with water and closely packed by gradually adding new manure and beating the pile with shovels. The center of the pile undergoes fermentation, and heat of more than 150° F. is generated.

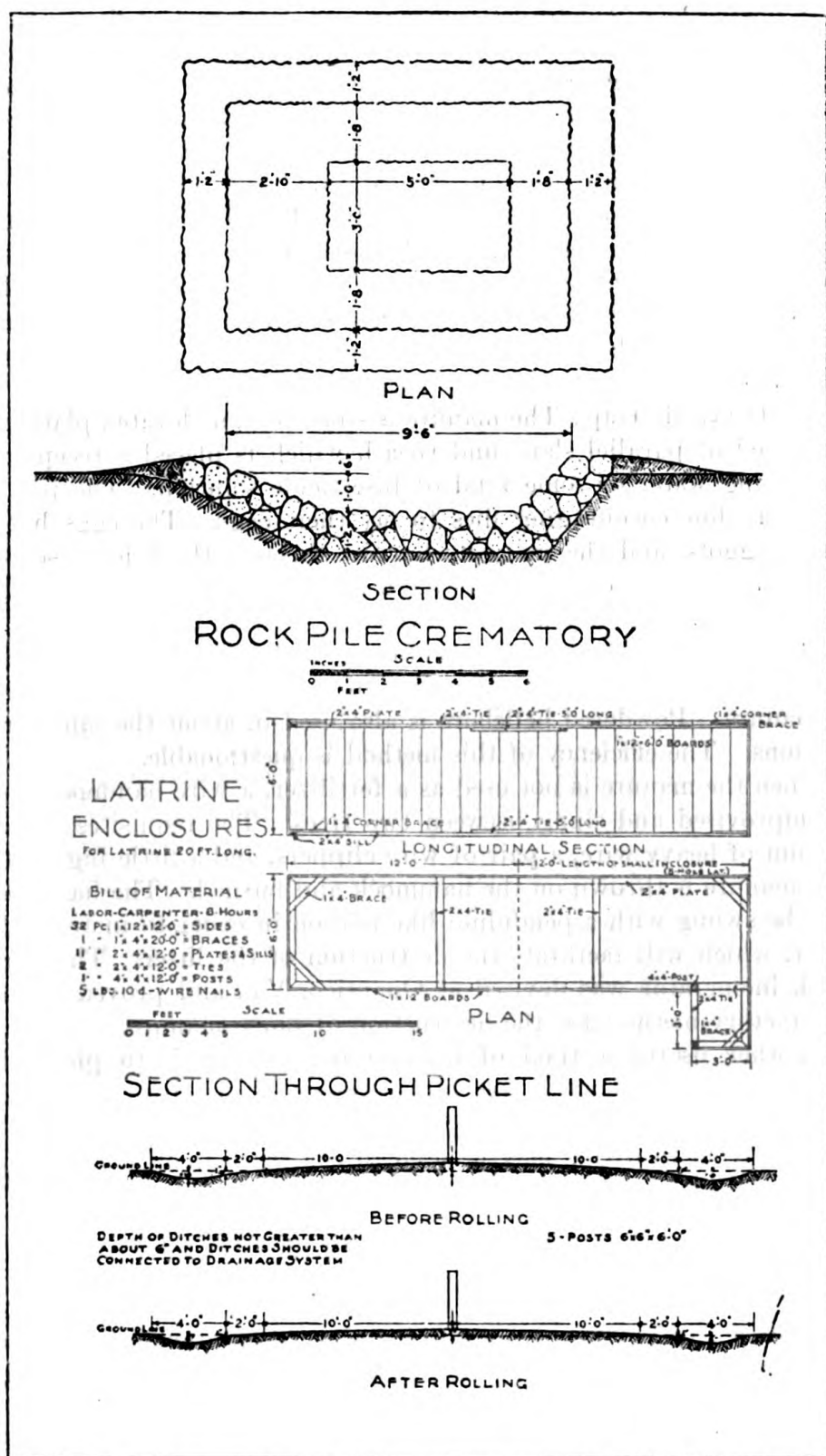


FIG. 13.—Rock pile crematory. From "Manual for the Quartermaster Corps, U. S. Army, 1916."

This heat is sufficient to destroy the eggs and larvæ of flies. Flies lay eggs only in fresh manure which is damp. They do not lay eggs in fermenting manure or dry manure. Eggs which are laid in fresh manure hatch within about 24 hours and the larvæ migrate away from the hot center of the pile to the cooler outer layers, because contact with heat of fermentation kills them. The larvæ of the domestic fly exposed to heat of 122° F. will die in about three minutes. When the larvæ of the domestic fly comes in contact with the gases of fermentation it is killed in about one minute at 124° F., in from four to eight seconds at 139° F., and from four to six seconds at 140° F. The daily amount of manure produced by one horse is from 1 to 2½ bushels.

(c) Larvæ fly trap: The manure is stored on an elevated platform composed of parallel slats, underneath which is placed a receptacle containing water or some kind of insecticide solution. The pile is exposed, thus encouraging flies to lay their eggs. The eggs hatch into maggots, and the maggots burrow through the pile in search of earth, with the result that they fall between the slats into the solution below, where they are destroyed.

Chemicals: Dissolve two-thirds of a pound of borax in 10 gallons of water, using a little over 1 gallon of this solution to each bushel of manure. Powdered hellebore is also used in about the same proportions. The efficiency of this method is questionable.

When the manure is not used as a fertilizer, a wire hammock may be improvised and slung between two trees. The requisites are an amount of heavy wire, a pair of wire clippers, and a little ingenuity. The manure is thrown on the hammock and burned. The hammock may be swung with a pendulum like motion in order to increase the draft, which will facilitate the destruction of the litter. The hammock incinerator was devised at Quantico, Va., and proved a very satisfactory method for the destruction of horse manure.

Another useful method of manure incineration is to place the manure in piles about 2 feet high—known as windrows—sprinkle with oil and burn.

Rails from railroads may be used to construct an incinerator for the cremation of stable refuse.

CARE OF THE FEET.

Value of proper foot care.—As Lelean expresses it, "We, as officers of military organizations, are concerned to prevent the loss of even *one* man in marching, and this can only be achieved by infinite pains and attention to a *host* of details, each *trivial in itself*."

Mobility is the first requisite of the soldier, and to insure this the Infantry officer should devote as much attention to the care of the

feet of the men of his unit as the cavalry officer devotes to the care of the feet of his horses. This, however, is not always the case.

The European authorities allow, when unseasoned troops take the field, for 10 per cent of incapacitation through preventable foot injuries. This is almost equal to the casualties following an engagement with the enemy. More emphatically expressed, should a "million citizens spring to arms over night," there is every reason

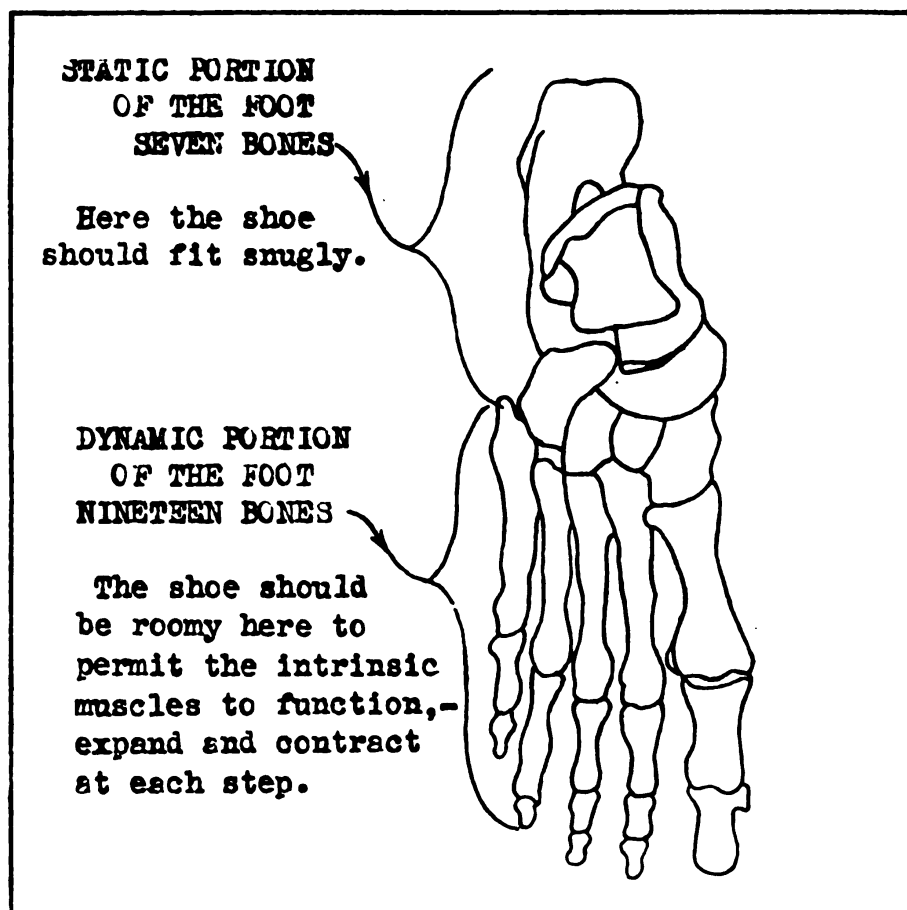


FIG. 14.—Bones of the foot.

to expect 100,000 of them to be on the sick list because of foot disorders.

According to Napoleon's dictum, "more battles are won by strength of leg than by force of arms." The military successes of Stonewall Jackson have been attributed largely to the marching capacity of his command, and that officer is quoted as saying that he had rather lose two men in a forced march than one man in battle.

* The data on care of the feet and shoe fitting are abstracted from "Foot Care and Shoe Fitting," by Mann and Folsom. P. Blakiston's Son & Co., Philadelphia, Pa.

Another military leader believes that battles are won more by "sweat than slaughter." According to Wellington "the most essential part of a soldier's equipment is a good pair of shoes, and—another good pair of shoes." Another military leader is quoted as saying that getting there first with the most men won battles. (Forrest.)

In the Franco-Prussian War, over 30,000 German soldiers were incapacitated in the first few weeks on account of preventable injuries to the feet.

"The army which marches best, other things being equal, is the successful army." (Munson.)

Anatomy and physiology of the foot.—The human foot, considered in its entirety, is indeed a very wonderful anatomic part of the individual. In the smallness of its size and weight, out of all pro-

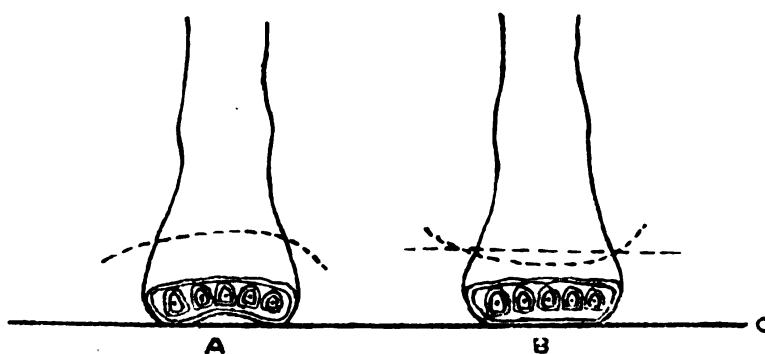


FIG. 15.—Cross section of feet showing metatarsal bones forming anterior arch. A shows formation of anterior arch by distal ends of metatarsal bones. Note convexity of instep, dotted line indicating integrity of arch and concavity formed on plane C. B shows fallen anterior arch. Note flat or convex instep, dotted line, and absence of concavity on plane C.

portion to the burden borne and carried, it constitutes a mobile, strong, flexible, and efficient member of the organism designed to bear weight forward, backward, and sideways without mishap. Encased in a cloth covering, the sock, and in a protective leather covering, the shoe, both concomitants of an advancing and exacting civilization, this member, the most unintentionally neglected part of the body, is fully expected to do its duty indefinitely without complaint. As with other mechanisms, mechanical or otherwise, so with this, ignorance can not accomplish satisfactory results.

Concisely, the structure of the foot is composed of a nicely adjusted aggregation of 26 bones of various sizes and shapes, each designed to perform a certain definite function.

Seven of these are of a very irregular shape and are located in the hind part of the structure, forming the heel and a portion of the so-called instep. The remaining 19, situated in the fore part of the foot, form a portion of and radiate fanlike from the instep. These

extend forward and to the outer and inner sides, finally ending in the toes. These different bones are held in correct position by ligaments, tendons, and muscles, the ligamentous support predominating in the posterior 7 bones which form the static portion of the foot, while muscular action predominates in the anterior 19 bones which form the dynamic portion. Over the dorsum or upper surface of the foot the muscles are few in number and lacking in development. However, on the plantar or lower surface, filling in the arch beneath the instep, there are five layers of well-developed muscles which buttress the arch, preventing descent of the latter when continued and excessive weight is borne.

The posterior seven bones, forming a compact mass held by ligamentous attachments, move very slightly when a step is taken and serve to minimize the shock of impact and act as a recoil mechanism. On this mass—the *static* portion of the foot—in the shod man all the weight of locomotion is first borne, first affecting the heel and center of the instep. The anterior 19 bones are controlled mainly by muscular action—the *dynamic* portion—and when in use bearing weight, move extensively. From the center of the instep the weight borne is shifted to the ball of the foot, which spreads medially and laterally, presenting an enlarged area to the walking medium. The toes also spread laterally, medially, and lengthen, gripping the surface. The longitudinal arch, on the inner side of the foot, extends from the heel (*os calcis*) to the distal end of the first metatarsal bone. This is definitely formed by the inherent structural concavity of the bones held among themselves by ligaments

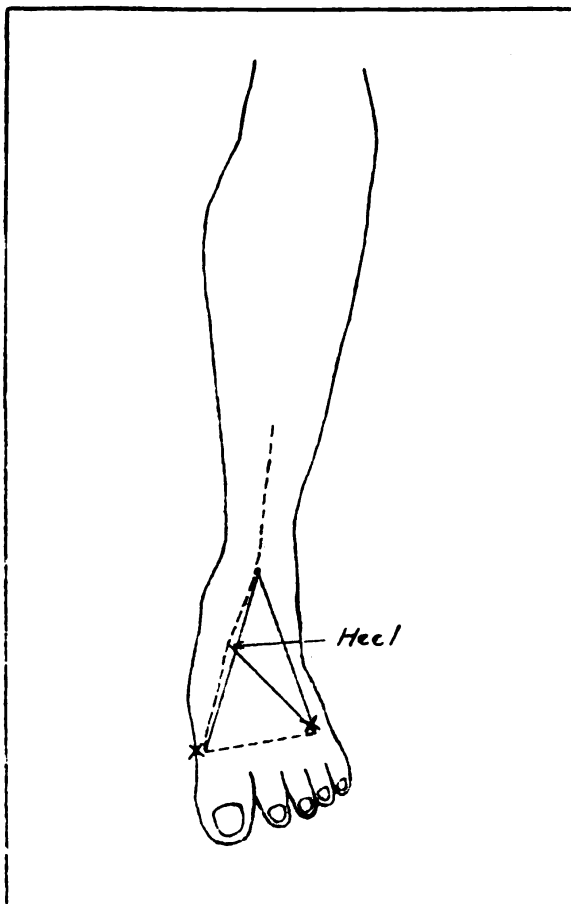


FIG. 16. Anterior view of foot and leg showing tripod formation of heel and distal ends of first and fifth metatarsal bones.

and supported from below by developed muscle layers. The anterior arch is formed by the distal ends of the metatarsal bones. The muscular development concerned in sustaining this arch is not so great as in the longitudinal. A tripod is formed by the structure of the foot, the apex of which is the highest point of the heel bone (*os calcis*), the inner side of the ball of the foot at the base of the big toe (distal end of the first metatarsal bone), and the outer side of the ball of the foot at the base of the little toe (distal end of the fifth metatarsal bone).

A comparison of the feet of the shod man and the barefooted savage is interesting and instructive. In the shod man the joints are not as flexible, the muscles are not as well developed, and the toes in walking do not spread and grip, being limited by the shoe. Taking a step he strikes the heel first, shifts the weight to the outer border of the foot, then full upon the ball, while the toes, as above explained, are limited in their motion. In that the shoes limit the bearing surface of the feet he "toes out" sometimes slightly, other times excessively, to preserve his equilibrium, thus throwing the weight borne backward on the inner border of the foot—on the arch—where it should not be borne. On the other hand, the savage has flexible joints, well developed muscles under the arch, as are also the muscles of the calf of the leg. In locomotion he has his feet parallel—the correct posture—or "toes in," throwing the weight upon the ball of the foot, center of the instep, and outer border of the foot. His toes, unhampered by a covering, spread widely, lengthen, grip the surface, and thrust vigorously backward. He walks on soft nonresistant earth which conforms itself to the irregularities of the foot, forming an accurate impression, which lessens the strain on the muscles and ligaments and minimizes the shock of impact. The reverse is true in the civilized individual who, his feet encased and limited in motion by a covering, the bottom of which does not conform to the irregularities of the foot, walks the greater part of his life on macadamized roads or rock pavements where muscle strain and shock on impact is great.

Care of the shoes.—Where the shoe is either too large or too small or with old or wrinkled or broken drill lining there inevitably results friction, pressure, and impact. These three factors are paramount in the causation of callosities, corns, blisters, abrasions, tender and sore feet. So, in the examination of a shoe when searching for the causative agent of foot disability, the fact that the shoe may be too large, too small, or too old should be borne in mind.

When injuries occur the shoe should be examined thoroughly for the points mentioned below:

1. Top of toes—*toe cap* too low, leather stiff, improper construction.

2. Ends of toes—shoe too short, loosely laced, improper construction.

3. Outer sides of big and little toes—shoe too narrow across the instep.

4. Over the instep—tightly laced shoes, uneven wrinkled tongue.

5. Along the outer and inner margins of the sole of the foot—faulty internal construction resulting in thick inner edge of insole or warping or curling of the latter.

6. On the soles of the feet—inequalities of the inner sole caused by the warping of the leather or shifting of the fill (layer below the insole).

The shoes being the most important part of the soldier's equipment and the backbone of an infantry organization's efficiency, it is essential and imperative that an elementary knowledge, at least,

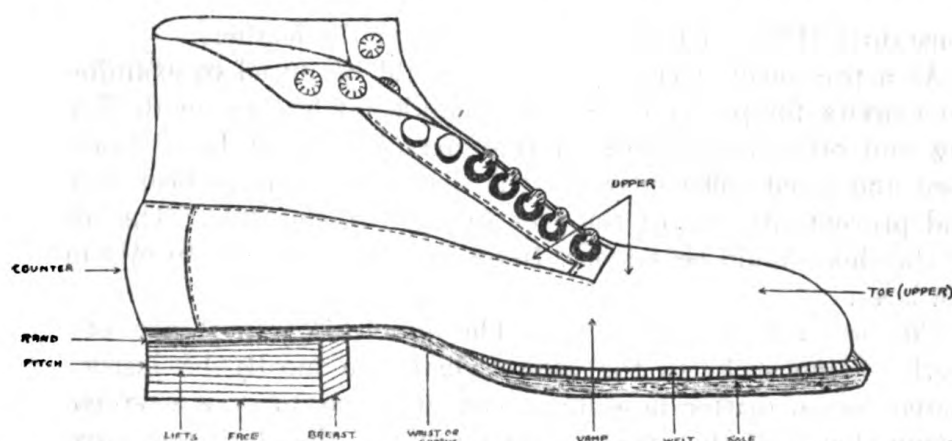


FIG. 17.—External parts of shoe. From "Foot Care and Shoe Fitting," by Mann and Folsom. P. Blakiston's Son and Company, Philadelphia.

of their care be part of the officer's training. This knowledge should be imparted to the men at each and every opportunity where the occasion offers itself.

To make the foot covering as waterproof as possible under ordinary conditions, the sole and welt should be thoroughly oiled with neat's-foot oil, bacon rind (salt removed by soaking), or in emergencies with machine oil of good quality such as used in the lubrication of the rifle. Where constant exposure to water and cold is anticipated, the upper as well should be thoroughly oiled by application of the oil and rubbing and kneading of the leather. Judgment, however, should be practiced in oiling the uppers because too much oil is a detriment, in that it clogs the pores of the leather, making the latter impermeable and preventing the moisture of the foot from evaporating.

Where the shoes have been water soaked from continued wetting, do not place them too near the fire, as such quick drying causes

stiffness and hardness of the leather, with the production of corns, blisters, abrasions, and similar affections. From the action of rapid drying, also, it should be noted that the leather decomposes and disintegrates quickly, lessening the life of the shoe. Where haste is necessary, pebbles may be heated and repeatedly placed in the shoe and agitated until a sufficient degree of dryness has been obtained. Hot cloths may be placed in the shoe, or oats, which absorb moisture readily. The shoes being dried by whatever method chosen, they should be thoroughly brushed and the leather kneaded with the fingers until supple.

Wet shoes should never be exposed to the elements in freezing weather as the leather will become frozen. Should the shoes issued be lined with drill ducking this should be examined frequently to see if it is torn, wrinkled, or lying smoothly in the shoe cavity. Dress shoes used for liberty should be kept brushed and polished constantly if long life is to be expected of the leather.

As a preventive measure, troops should be urged to examine the shoe cavity for protruding nails, wrinkles of leather, or drill ducking and other inequalities of the surface. Broad laces should be used and laced sufficiently for the march to hold the heel in place and prevent shifting of the foot forward in the shoe. The tongue of the shoe should be smooth, free of wrinkles, and lie evenly under the laces.

Fitting and care of socks.—The practical importance of correctly fitting socks to the infantryman can hardly be justly estimated, as no matter how much care and judgment is exercised in fitting shoes, all this work is for naught if the cloth foot covering is too large or too small. The inevitable conclusion is thus reached, that a sock too loose or too tight in a correctly fitting shoe does as much damage and incapacitates the individual as much as a poorly fitting shoe.

The way to the ideal system of fitting sock sizes to the corresponding shoe sizes is partially obstructed by obstacles which must be overcome if complete success is to be attained.

Essentially, these obstacles to our progress consist of various differences which exist in socks of the same weight, size, and material; namely, flexibility and shrinkability. This is applicable to both woolen and cotton socks. Further, there is to be considered the multiple variations in the relative length, width, and shape of the feet. Although it is readily conceivable that a sock of elastic material will be conformed to the shape of the foot, yet there is to be considered the fact that the different materials after repeated washings sometimes will not do this. An ideal material whose definite elasticity and shrinkability is predetermined accurately, and reserva-

tions made for variations, will do much toward establishing some fundamental plan for fitting socks accurately.

At the present time a general plan consisting of a "sock size scale" which corresponds to the different shoe sizes has been adopted to remedy as much as possible the existing evil of ill-fitting socks. This scale can be readily understood by reference to the following:

Shoe size.	Corresponding sock size.
5 and 5½	10
6, 6½, and 7	10½
7½, 8, and 8½	11
9, 9½, and 10	11½
10½, 11, and 11½	12
12, 12½, and 13	12½
13½, 14, and 14½	13
15	13½

Cleanliness of the feet.—The first essential in the proper care of the feet, as of the body, is rigid attention to cleanliness. Where this is neglected there accumulates an excessive amount of perspiration, fatty material, dirt, and skin scales which, under the action of bacteria, decompose, causing an offensive odor and the skin to disintegrate. The individual then suffers from abrasions, blisters, tender, sweaty, and flacid feet.

To maintain a standard of cleanliness and relative freedom from foot trouble and disability, inspections should be made. In the barracks this inspection should be made at least every fortnight. The company commander, accompanied by a sergeant who takes notes if necessary, passes through the barrack buildings inspecting each man as he stands in his bare feet at the foot of his bunk. This can be accomplished in a very short time if the method is systemized. Some will maintain that this is repugnant and beneath the dignity of an officer. But the same is true of many other things in military life. Surely if cavalry officers can take scrupulous care of the hoofs of their horses, infantry officers can do the same with the feet of their men. One is just as important as the other.

In the field, foot inspections are even more imperative. The feet should be inspected before and after every march, so that all minor and trivial injuries can be attended to promptly and prevented from becoming disabling affections which cripple the efficiency of a command.

Daily foot baths should be taken with cool or tepid water, using very little soap. Do not soak the feet as this softens the skin. If household ammonia is procurable, a few drops of that in a basin is advisable. Cool or cold water is to be used because it not only hardens the skin and eases the sensation of burning after a march but also increases the tone of the foot. By tone is meant a stimulation where-

by the muscles are held in a state or condition of continuous contraction ready to respond quickly to the slightest call. After washing, of course, the feet should be thoroughly dried.

In the field the feet should be washed and the socks changed after every hike. By scraping a hole in the ground over which is spread a poncho, a suitable basin is readily made into which water may be poured from a canteen. Where water is scarce, just a few spoonfuls poured on a towel, handkerchief, or paper and applied between the toes suffices.

Both in the past and at present the toenails, according to an unassailable custom, have been cut "round." The corners should not be trimmed off as this encourages a nail to grow into the flesh resulting in an ingrown nail. Nails should be cut straight across every two weeks. Nails deformed by overgrowth, such as unusually thick nails and clubbed nails, can be remedied by soaking in hot water and paring down with a knife, or rubbing down with sandpaper.

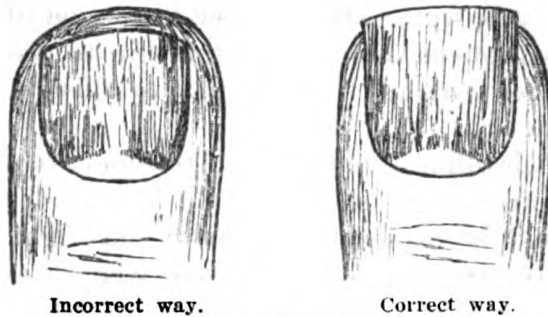


FIG. 18.—Trimming of toe nails.

The material under the nails should be removed with a toothpick or similar article and *not* with the point of a scissors.

Blisters and abrasions.—

The most common causes of blisters are friction, pressure, or impact. Accessory causes are ill-fitting shoes and socks, over-

riding toes, hammer toes, poorly constructed, uneven, cheap shoes, heat, moisture, and uncleanness. They are most often found in those whose foot skin is tender and soft, e. g., among newly recruited troops and those not accustomed to hiking. The points usually affected are the outer surface of the little toe, upper surface of the toes, surface and back of heel, upper surface of the foot under the shoe laces, ball of the foot, and over the tendo achillis (the large tendon attached to the upper surface of the heel bone). The formation of blisters is a protective process. Irritation of the outer, or false, and inner, or true, skins being continuous, there arises an inflammation of both, during which the inner skin exudes an inflammatory fluid and raises the outer, thus forming a blister.

Treatment is directed primarily toward the cause. Inspect and remedy defects in the shoes or socks, such as nails, fallen toe cap, ill-fitting insoles, worn lining, tight lacing, uneven stitching, as over the tendo achillis posteriorly, and badly worn, darned, small, or

dirty socks. Apply to blister tincture of iodine $3\frac{1}{2}$ per cent or grain alcohol. Immerse needle in alcohol or heat in flame and puncture at the base, allowing fluid to escape and causing outer skin to collapse on the inner or true skin, thus protecting the latter and minimizing the possibility of infection (invasion of microbes). The blister (outer or false skin) should not be torn or removed. Dry the skin with gauze or absorbent cotton and cover the blister with adhesive plaster, which should be firmly pressed down so that the raised outer skin or epidermis will be forced into position. The adhesive may be made to stick well by heating it with a match or by applying ether if the latter is to be had. Should it be impossible to procure adhesive plaster, then sterile vaseline, boric acid ointment, or zinc oxide ointment may be applied with benefit. If these last-named articles are at a premium, the regulation foot powder may be dusted on the part and a few turns of a gauze bandage made. All the dressings being completed, a moderate amount of the foot powder should be dusted on them and into the shoe. The powder prevents the edges of the adhesive plaster from adhering to the sock and lessens friction in the shoe cavity. Care should be taken not to use too much powder because a large quantity tends to cake and form uneven surfaces. Search should be made for all areas which are red and tender with no formation of blisters. Adhesive plaster should be placed over these.

Heel blisters occupy such a prominent place in the category of transient foot ills that they should be given careful attention. Usually caused by defective socks or poorly constructed and ill-fitting shoes which allow the heel to slip, they form by far the great majority of blisters. The structural defects of the shoes are usually (*a*) heel too narrow or broad, (*b*) shoe too long, (*c*) shoe too broad across the instep or with high heels, (*d*) incorrect posterior curve of shoe not conforming to heel and tendon, and (*e*) improper lacing. In the individual with a long narrow foot and narrow heel, or the one with a broad foot and a narrow heel, much benefit can be derived by placing a felt pad, varying in thickness, corresponding to the tongue of the shoe in size and posterior to it. The greater part of these blisters will be avoided by a proper measurement and fitting where the heel is regarded with more care. The figure-of-eight marching strap, originally devised and used by the French, will prevent the heel from slipping up and down on the march, in the great majority of cases.

Abrasions are nothing more or less than blisters with the raised outer skin or epidermis removed, thus exposing the rose-red derma or inner skin. They are very painful due to the fact that the sensitive nerve endings in the derma or inner skin are unprotected by

their normal covering. The causes of abrasions are those of blisters. The treatment is primarily corrective. The cause should be sought for and remedied. Protective treatment includes the applying of ethyl alcohol or iodine ($3\frac{1}{2}$ per cent) to the area and then zinc oxide adhesive plaster.

In lieu of the adhesive plaster, zinc oxide or boric-acid ointment may be applied plus a few turns of gauze bandage.

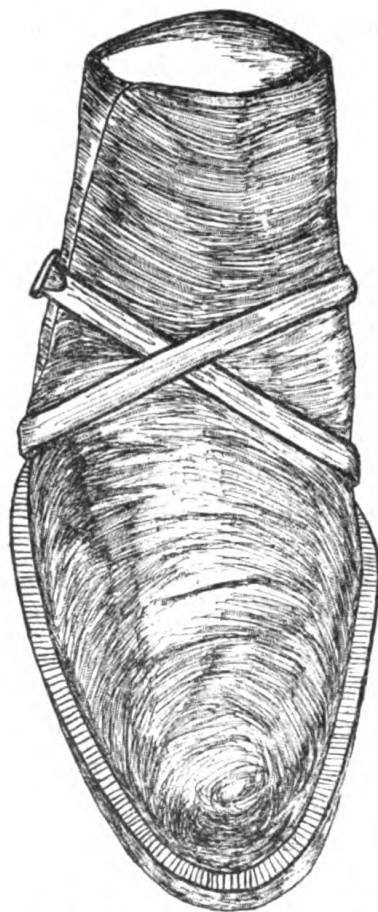


FIG. 19.—Front view of the "figure of eight" strap military shoe.

In the prevention of blisters or abrasions there are three factors which determine the functional integrity of the foot:

1. Proper measuring of feet and fitting shoes.
2. Proper corresponding sock sizes.
3. (a) Feet injured to hiking or (b) prepared for such.

That feet injured to hiking will escape much injury is self-evident. At this point, however, should be mentioned the application of formaldehyde solution (10 per cent) on alternate days until six applications have been made to the soles of the feet and especially to the points exposed to pressure. This serves to harden the skin and lessens the chance of inflammation. Adhesive plaster may be placed over suspected pressure points, before the march, to prevent the formation of blisters. Socks of the same weight as those worn when the shoes were fitted should be used.

Shoe fitting.—The responsibility for properly fitting shoes rests with the company commander. The medical officer acts in a purely advisory capacity and consequently should be prepared to give expert advice on this subject.

Shoe-measuring devices: The Resco (Regal Shoe Co.) shoe-measuring device was adopted by the United States Army, Navy, and Marine Corps during the World War.

This device registers the length (size) and width (last) of the shoe required to fit the inserted foot. (Space prevents detailed description of the use of this device, which can better be demonstrated than described.)

Our experience in fitting over 20,000 men with shoes by the aid of this device tended to prove that it is very satisfactory.

Fitting by trial: By this method the foot of the man is fitted with different shoes until the appropriate size and last which will best fit the foot is found.

In either case the shoe should be fitted to the foot with the man carrying a rifle and in heavy marching order or else a 50-pound load on his back and with the *body weight borne on one foot*. Under these conditions the foot flattens out and tends to elongate about two-fifths of an inch or more.

There should be one-fourth of an inch or more space between the big toe and the cap of the shoe when the weight is borne on one foot, and this determines the length (size) of a properly fitted shoe.

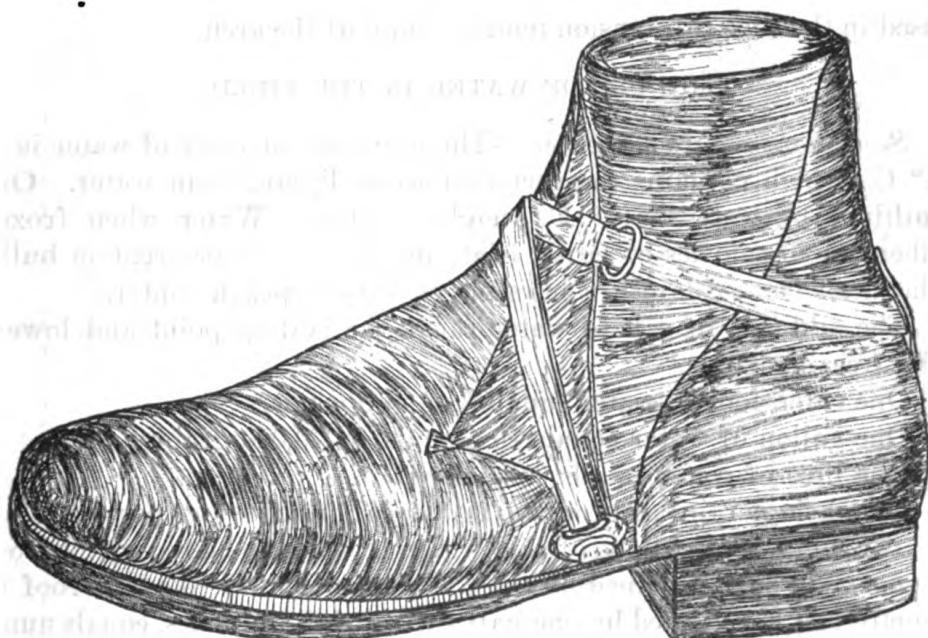


FIG. 20.—A "figure of eight strap" military shoe devised by the writer.

Width, if not accurately determined by the measuring device, must be determined by hand. The person to be fitted faces the fitter, who grasps the leather back of the toe cap with the index finger and thumb. A faint movement of the leather should be detected by the gripping fingers if the width size is correct. Where a distinct ridge of leather is picked up the inference is that the width is too large, and conversely if no movement of the leather is detected the width is too small. In estimating width much depends upon the training of the fitter and his judgment. However, in addition to the above, the comfort of the individual is considered and the question is asked whether the toes are pressed upon tightly or the shoe is too loose over this particular part.

A "figure-of-eight strap" military shoe, which firmly fits the heel, loosely fits the anterior portion of the foot, and prevents pressure atrophy of the intrinsic muscles of the foot, has been devised by the writer. This shoe is anatomically and physiologically correct, as it closely fits the "static" portion of the foot which is relatively free from muscles and nerves and loosely fits the "dynamic" portion of the foot. The advantages of the "figure-of-eight" strap has been demonstrated by the French Army. The idea of combining the flap and the strap is original with the writer and is patented. The shoe tends to prevent foot deformities by the development of the muscles which strengthen the arches. It has been found useful in cases of pes planus. When the weight of the body is borne on one foot, as in walking, the movement of the tendons either at the front or rear of the ankle produces tension on the strap, and if a flexible shank is used in the shoe this tension tends to support the arch.

THE USE OF WATER IN THE FIELD.

Some data regarding water.—The maximum density of water is at 4° C., which explains the fact that ice is lighter than water. One milliliter of water at 4° C. weighs 1 gram. Water when frozen liberates 80 calories of latent heat, and expands 9 per cent in bulk; the latter fact explains the bursting of water pipes in winter.

The addition of salt to water raises the boiling point and lowers the freezing point.

One cubic foot of water equals 7.48 gallons.

One gallon of water equals 10 pounds, or 70,000 grains.

One liter of water equals 0.26418 gallon.

One inch of rainfall produces 22,500 gallons of water per acre.

The number of gallons of rain water expected to be recovered from a roof may be determined by the following formula: Area of roof in square feet, multiplied by one-half the rainfall in inches, equals number of gallons.

To compute the volume of water of a flowing stream the following may be used as a guide: Sectional area in square feet, multiplied by 0.8 velocity in feet per minute, multiplied by 7.48, equals gallons per minute.

Officers responsible for water supply.—The quartermaster is responsible for the procurement of water rights and for the delivery of the water to the camp site.

The medical officer is responsible, in an advisory capacity, for the quantity and the quality of the water at the source as well as at the ultimate point of consumption.

The unit commander is responsible for the proper distribution of the water within the organization.

Water consumption.—Water constitutes 60 per cent of the body weight, or the equivalent of 10 gallons, which equals 100 pounds approximately in the average man's body. The loss of 1 gallon of this water has serious consequences; if $1\frac{1}{2}$ gallons are lost, the result is fatal. It is estimated that 1 quart of water is sufficient for about $7\frac{1}{2}$ miles of marching.

The quality and the quantity of the water supply is a vital factor during field operations. In a war of movement the supply of water

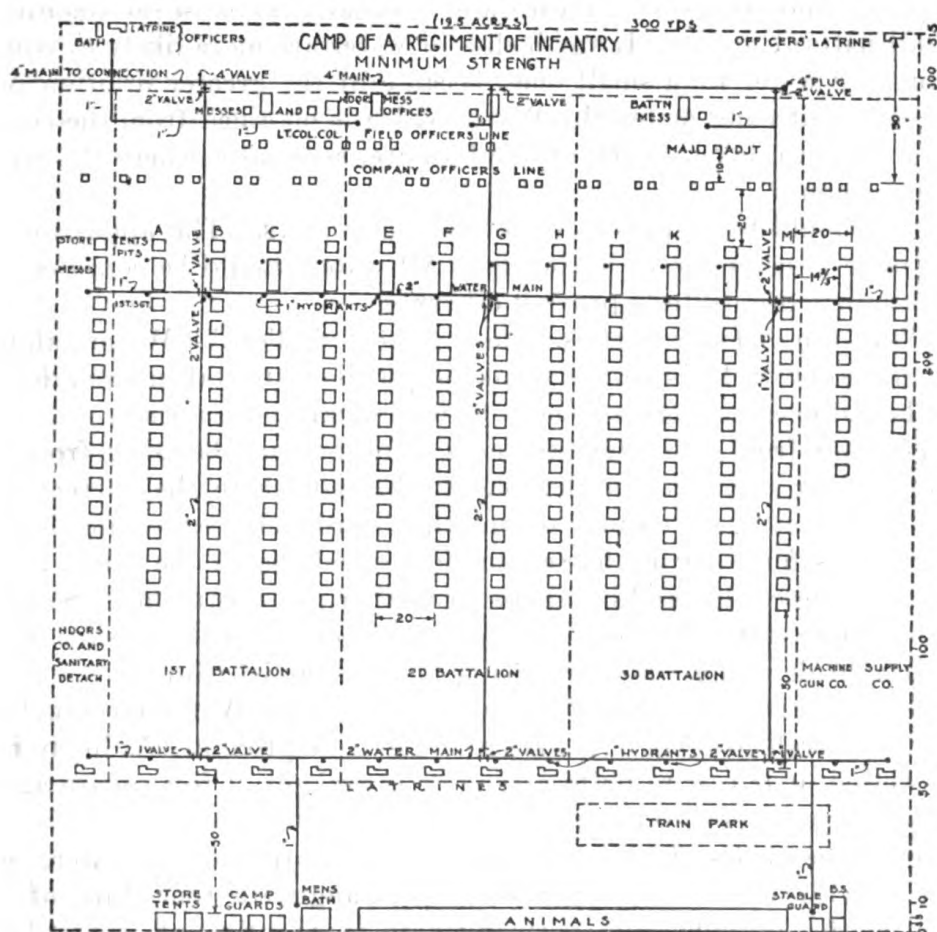


FIG. 21.—Camp of a regiment of infantry with plan of water system. From "Manual for the Quartermaster Corps, U. S. Army, 1916."

is very apt to be inadequate, which may mean that the consumption of water will have to be restricted to a minimum.

The minimum allowance of water for the needs of men and animals varies according to the amount of daily labor performed and also the conditions of the weather. The following may be taken as a minimum: Each man, 1 gallon per day, to be used as follows: $1\frac{1}{2}$ quarts for drinking; $2\frac{1}{2}$ quarts for cooking and drinking with meals.

The above is the minimum for soldiers on the march and in bivouac. It makes no allowance for the washing of person or cloth-

ing. To this minimum must also be added 8 gallons of water for each animal.

In camps of more than one night duration the following minimum allowance should be furnished: Five gallons per day per man; 10 gallons per day per animal.

Source of water.—The sources of water are divided into (a) surface waters, such as lakes, ponds, rivers, streams, etc.; (b) underground waters, which include wells, spring, etc.: all these vary in degree as to purity and potability. Rain water is usually the most satisfactory of all natural waters. Large bodies of water are more likely to contain pure water than small ones, because of the greater dilution of the contaminating material. Water which is obtained from the center of a large lake is very apt to be pure, especially where the sun shines upon it.

One should be suspicious of all surface waters. The appearance of water is no index to its purity. All water should be considered contaminated until tests prove it otherwise.

Wells are of two varieties, "deep" and "shallow." Water taken from shallow wells is always suspicious, while water taken from deep wells and deep springs is usually fit for human consumption.

If water from a running stream is used, it should be taken from a point where there is considerable depth, and where the current is strong; always "upstream," or, in other words, above the camp site. Provisions for watering horses should be made below the camp, and for washing clothes and bathing still farther "downstream." Sometimes white, blue, and red flags are utilized to mark the sites for obtaining drinking water, watering animals, and bathing.

Storage, collection, and distribution of water.—Water receptacles should be well covered. As the ground in close proximity is likely to be wetted, it is best to build a sand or gravel pit, 2 feet square and 1 foot deep, to absorb the waste.

The receptacles should be cleaned daily with boiling water, or rinsed with a solution of potassium permanganate (one-third of a teaspoonful of potassium permanganate to 1 gallon of water. A solution of chloride of lime is also very good for this purpose in proportion of 1 to 1,000. These solutions are harmless and more certain in their action than boiling water used alone.

Canteens when not in use should be emptied, dried, and cleansed with one of the above solutions. Weak tea has been highly recommended for drinking purposes in canteens; it should be boiling hot when poured in, thus insuring the sterility of the canteen as well as of the contents.

Common drinking cups should not be used. If individual drinking cups can not be supplied, *lip drinking* should be practiced. Should conditions arise which make it absolutely necessary to use

common drinking cups, a certain degree of safety can be insured by keeping the cup immersed in a solution of formalin (1 per cent).

Water purification.—1. Chlorination: Chlorination is extensively practiced to-day. Hypochlorite of calcium (bleaching powder) is the substance used, and is found on the supply table of the Medical Department under the caption "Calx chlorinata." A simple formula for its use is as follows:

Dissolve 1 teaspoonful of chlorinated lime, taken from a freshly opened container, in 1 quart of water and label this "stock solution." This solution deteriorates rapidly and a fresh solution should be prepared every fourth day.

One-half teaspoonful of this stock solution added to each gallon of water and allowed to settle for 30 minutes will insure the destruction of most bacteria.

2. The Lyster bag: The Lyster bag will be furnished by the Quartermaster's Department, United States Marine Corps. This bag consists of a round canvas sack, 28 inches in length and 20 inches in diameter, weighing about $7\frac{1}{2}$ pounds, and may easily be folded for field carriage.

The purpose of this bag is not to transport water in the field but to provide a means of sterilization and a stationary container for the water which is distributed from the faucets attached to the lower part of the bag.

The capacity of the Lyster bag is between 30 and 35 gallons, which is sufficient to fill the canteens of 100 men.

A tripod formed by three litters makes a very good support for this bag. In the absence of litters a tripod may be formed from boughs of trees or iron pipes. A trifoil support is used by the United States Army but has not yet been adopted by the Marine Corps.

3. Chlorination of water in the Lyster bag: Water which is obtained from muddy streams or pools must first be cleared before calcium hypochlorite is added. This is accomplished by allowing the water to stand for a certain period of time, when the mud will settle to the bottom of the container, or it may be cleared by filtration, for which purpose a blanket may be used.

Calcium hypochlorite is the chemical used for water chlorination in the Lyster bag, and is supplied by the Quartermaster's Department, United States Marine Corps, in small glass tubes, each tube containing 15 grains (1 gram).

1. Break a tube of calcium hypochlorite and place the contents in a canteen cup containing just enough water to form a paste.

2. After forming a paste, the canteen cup is nearly filled with water and the calcium hypochlorite is dissolved by stirring well while adding the water.

3. Empty the solution into the bag full of water.

4. Wait 30 minutes before using the chlorinated water.

This strength renders chlorine in proportion of 1 to 5,000,000, and this is usually more than sufficient to sterilize the water.

Chlorine will kill all germs in water (which has not too great an amount of organic matter) in strength of about 1 part in 7,000,000.

For methods of ascertaining whether sufficient free chlorine is present in the water, the reader is referred to paragraph 2666, *Manual of the Medical Department, United States Navy, 1922*. The orthotoluidine method is recommended:

Take 8 drops of orthotoluidine solution (0.1 per cent orthotoluidine in 10 per cent hydrochloric acid solution) and add this to one canteen cup three-fourths full of the water from the Lyster bag, to be tested. If free chlorine is present in the proper proportions the water in the canteen cup will assume an orange color. A lighter or darker color indicates that there is insufficient or an excess amount of chlorine present.

4. **Boiling:** Boiling is a simple and effective method of water sterilization and may be used in the presence of an epidemic of intestinal disease, such as dysentery or cholera, and when materials are lacking for sterilization by other methods.

Boiling all drinking water entails a considerable amount of fuel and time.

For 250 men nearly 3 barrels of drinking water are required each day. It will be quite a tax upon the rolling kitchen if the boiling is to be done there.

Boiled water has a flat taste unless it is aerated after cooling. Its taste may be improved by the addition of tea or coffee.

Water may always be boiled in the field when fuel is available for this purpose. Each man can boil water in his canteen, by placing the canteen full of water in a fire, or upon hot coals until the water boils, after which it is removed and allowed to cool. Troops can, after a day's march, prepare their canteens full of boiled water for use on the next day.

Field filters.—The barrel filter consists of a small barrel inserted into one of larger dimensions and separated from the bottom of the larger barrel by about 3 inches of fine sand. The smaller barrel, having a perforated bottom, is placed upon the sand in the larger barrel; then more sand is placed around the small barrel to the height of about 6 inches. A layer of charcoal and a layer of gravel may be placed above the sand.

The barrel filter may be sunk into a lake or spring; water may also be filtered by pouring it into the larger barrel.

In connection with drinking water, special attention should be given to the following:

1. Regard all water in the field as contaminated unless proved otherwise.
2. Do not let the men fill their canteens from any unauthorized source.
3. Place a guard at the source of the water supply to prevent its pollution.
4. Water discipline on the march should be rigidly enforced.
5. Remember that not only the quality but the quantity of water supply should be supervised by the medical officer.
6. The amount of water lost by evaporation, and otherwise, by a man marching for 1 hour, or 3 miles, is nearly 1 pint.

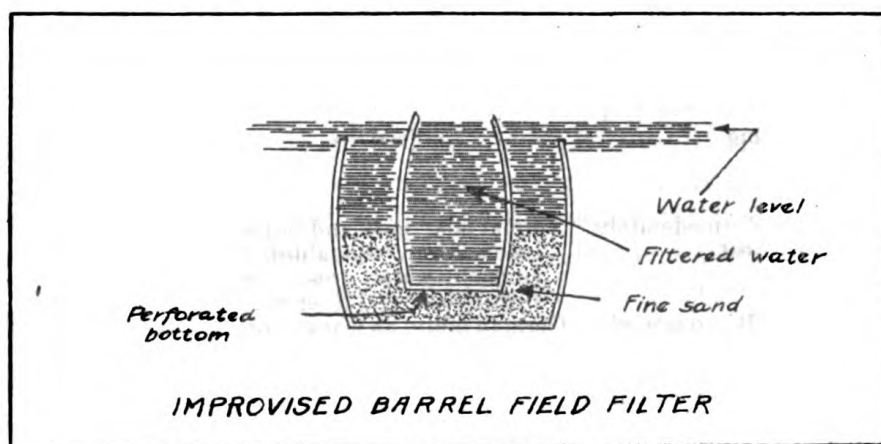


FIG. 22.—Improvised barrel field filter.

7. The results obtained by modern military organizations demonstrate that water-borne diseases are preventable.
8. The prevalence of a water-borne disease in a camp indicates a weak link in the chain of sanitary measures.

FOOD IN THE FIELD.

In the military service the diet is determined and prepared for the men, so that the individual soldier often has little or no means of obtaining the articles of food for which his system may crave. This is particularly true of conditions in the field. Hence this partially explains why we, as medical officers, should pay detailed attention to the food issued in the field, in order to prevent diseases caused by a deficient diet.

A discussion of the component parts of a well-balanced ration would be a departure from our subject and, as this data may be found in textbooks, only certain aspects of a military ration which are related to field conditions will be considered.

The popular topic of discussion—vitamines—has a direct relation to field messing and will receive brief consideration.

Vitamines.—"Vitamines, or accessory food factors, are soluble dializable bodies of an indeterminate value existing in minute amounts in natural food and are necessary constituents of diets. They exist in greatest amounts in the contracted nutrients provided by nature for the early stages of new life, as in milk, eggs, and the germ and aleurone layer of grain." But as a general rule, all natural foods are vitamine containing to a greater or less extent.

The deficiency of vitamins in the diet markedly affects the functional activity of the endocrine glands, such as the adrenals, pituitary body, thymus, and gonads; and cause such diseases as scurvy and beriberi; possibly war edema and pellagra are also caused by a deficiency of vitamins.

Three vitamins are now recognized—there may be others.

Name.	Food.	Diseases caused by deficiency of—
Fat soluble "A" (moderately affected by heat).	Animal fats; milk and butter; green leafy vegetables, as spinach, water cress, and turnip tops; cod-liver oil.	War, starvation, prison, camp, or alimentary edema. Rickets.
Watersoluble "B" (relatively stable to heat and drying, 80 per cent intact after 1 hour and 60 per cent intact after 2 hours of boiling).	Germ of grain, as wheat, corn, etc.: eggs and milk; yeasts.	Beriberi.
Vitamine "C" (antiscorbutic. Boiling destroys 95 per cent in 1 hour, 80 per cent in 40 minutes, 50 per cent in 20 minutes).	Green vegetables; fresh fruits; canned tomatoes, when not overheated prior to canning.	Scurvy.

The above table is of practical importance as it shows that prolonged cooking, such as is apt to occur with rolling kitchens, tends to destroy the vitamine contents of the ration.

The vegetables for stews should be cooked separately and not longer than 30 minutes; then they should be added to the meat, which requires about 2 hours of cooking. Avoid the use of alkali, e. g., sodium bicarbonate, when cooking green vegetables, as this also tends to destroy the vitamins.

In Mesopotamia over 11,000 cases of disease due to food deficiency developed in six months—hence the practical importance of medical supervision of the field ration.

"British troops in Mesopotamia during the late war—eating white bread—suffered from beriberi, while the Indian troops—eating unmilled wheat—escaped. During the siege of Kut the reverse was

the case—the British living largely on fresh meat, while the vegetarian Indians lived largely on white bread.” (Stayer.)

During the late war an outbreak of scurvy occurred in the British Army among the men of the South African Labor Corps. Without the alteration of their diet, the period of cooking was reduced from 6 hours to 45 minutes, and the outbreak was immediately arrested.

The vitamine-containing foods of an exclusive military ration should weigh at least 30 per cent of the total.

Caloric value of the military ration.—It has been found that a ration consisting of 3,700 calories was insufficient for troops in the front line. It has been experimentally proved that troops on a test march could maintain weight on a ration of 4,100 calories.

If troops must entrench after a day's hike, a total of 5,000 to 6,000 calories per day is required. It is often impractical for a soldier to assimilate such a large number of calories per day, and, consequently, in time of war soldiers are allowed a greater amount of food (often at the expense of the civilian population) so that they may have a reserve supply of fat in the body to enable them to temporarily withstand the unusual expenditure of foot-pounds of energy. It is stated that 20 pounds of reserve fat in a man's body will supply 3,000 additional calories per day for a period of 30 days.

The following is the caloric value of the United States Army ration:

	Calories.
1. Reserve (haversack ration)	2, 825
2. Mobile	3, 500
3. Normal	4, 125
4. Special	4, 850

The heat of hot drinks and hot food supply additional calories. One pint of hot tea will give 50 calories of direct heat to the body. Hence the stimulating effect of hot tea, coffee, soup, and broth after a long march.

Daily menu.—It is advisable to prepare the daily menu at least 24 hours in advance. The medical officer should carefully scrutinize the daily menu, and not only inspect the food as to quantity and quality, but the necessary precautions should be taken to see that there is a variety of food prepared.

There is often a tendency for cooks to prepare an excess of stews, which may cause dissatisfaction among the men.

When on the march or otherwise heavily worked, the men will have a craving for sweets; a liberal amount of jam should be provided to satisfy this craving.

The presence of much refuse food in the garbage can is a rather good indication that the men are not receiving the proper kind of food, or that it is not palatably served.

Food inspection.—Trim off the tainted parts of the quarter of beef. By sinking a probe into the shoulder or hip joint, the odor of the probe will determine whether decomposition has set in. A whole quarter of beef should not be condemned because part of it has begun to decompose, as it is often possible to trim off the tainted portion and serve the remaining wholesome portion. The hind and fore quarters of beef should be issued alternately.

The meat should not be placed in cold storage until the animal heat has left the carcass. On one occasion a large number of beef quarters decomposed in the cold storage of a ship because they were placed there shortly after killing and before the animal heat disappeared from the carcass. The outside of this meat was frozen, yet the parts around the bone had time to decompose.

In the field a percentage of the rations are issued in tin containers; which, due to improper preparation, exposure to excessive heat, and lack of care in handling, frequently undergo decomposition and are especially dangerous to health if their use is permitted. Therefore a careful inspection of all canned goods should be required.

The terms "springers" and "swells" are applied to bulged, blown, or swelled cans. These cans when pressure is applied at the ends give a crackling sound. "Springers" are caused by overloading the cans, and, though not desirable, the contents are fit for use. "Swells" are caused by the formation of gas, due to decomposition; and may be differentiated from "springers" by a splashing sound when the can is shaken, and a hollow note when gently tapped. These should be condemned.

Occasionally the inside of a can may present a blackened appearance—so-called "can burn." This condition is not due to putrefaction, but is caused by the precipitation of stannous sulphide in an acid medium.

Formerly a can with two solder holes was indicative of a "swell" which had been punctured to let out the gas and then resoldered, but now many manufacturing firms use two solder holes in sealing their cans. It is well to reject cans with three solder holes.

Washing mess gear in the field.—After meals all mess gear should be sterilized in boiling water. In a semipermanent camp the mess gear may be placed in wire racks and washed by immersion for five minutes in water that is kept boiling.

On the march and under conditions where the mess kits from the haversack are in use, the following method of washing the individual mess gear is employed:

Immediately after the men have finished eating they should form a line and pass a garbage can or pit where the refuse liquid and solid food is disposed of. After disposing of this refuse

food each man inserts his mess gear successively in three cans. These cans are placed over a trench in which a fire is burning. The first and second cans contain boiling soapy water, while the third can contains boiling clear water. A few moments insertion in each of these cans is usually sufficient to cleanse the utensils. After insertion in the third can, the mess gear dries by its own heat almost immediately and no wiping is necessary. Care should be taken to see that the water in each can is kept at the boiling point, as lukewarm dishwater is a potent factor in the dissemination of saliva-borne diseases.

It appears that the military sanitarians have waged a successful battle against intestinal diseases, but during the recent war the sputum-borne diseases of the respiratory tract, such as influenza and pneumonia, did not always yield so readily to preventive sanitary measures.

During the Civil and Spanish-American Wars the intestinal diseases were prevalent, while in the recent great conflict perhaps more persons died from respiratory diseases than were killed in action.

Field kitchen.—The use of rolling kitchens on the march has superseded the old method by which each man cooked his own food. One rolling kitchen supplies food for 200 to 250 men.

The field kitchen should be located on the opposite side of the camp from the latrines and the urinals. Some means should be available to protect the food from dust and sand. If circumstances permit, the kitchen should be screened; if not, other precautions should be taken to protect food from flies and other insects. Burlap sacking may be used for purposes of screening when other material is not available.

There should be a sufficient supply of pure water on hand at all times. A supply of material for cleaning purposes, such as soap, soda, soap powder, scouring material, boiling water, and dishcloths, should be available.

The floor of the kitchen may be oiled to allay dust.

The cooks and other attendants working in the kitchen and handling food should be instructed in personal hygiene. Rigid supervision is necessary to prevent the cooks from becoming lax in personal cleanliness, especially in keeping the hands and the finger nails clean.

Physical examination of all food handlers should be made at regular intervals; and if the laboratory facilities permit, an effort should be made to detect and eliminate any disease carriers among them.

Liquid and solid refuse should be disposed of as soon as practical. The outside of all garbage cans should be kept clean, and the cans should be kept covered at all times.

The object of all cooking processes is:

(a) To make food more digestible and appetizing.

(b) To destroy germs and parasites.

Mess halls.—The mess halls should be located near the kitchens.

Make the necessary provision to protect the food in the mess halls from flies, dust, and sand, using wire screening if available.

Clothes and toilet articles must not be stored in kitchens or mess halls.

The mess tables should be cleaned and sunned at regular intervals. Care must be taken to see that food particles do not collect in the cracks of the tables.

One of the best methods to prevent the collection of food particles in the cracks of the tables is to construct the tables with a removable center board which may be lifted off, and thus permit the cleaning of the cracks between the boards. Another method is to construct the table with a 2-inch space between the boards.

SANITARY ORDERS.

Sanitary orders are written instructions intended to outline a uniform system of sanitation for the command and to convey such other information of medical interest and of administrative detail as the chief surgeon may deem necessary.

It is most important that medical officers become conversant with the technique of the preparation of such orders. It will be seen that military organizations follow a more or less uniform system of construction in the preparation of orders.

A sanitary order should consist of:

(a) Heading. This gives—

1. The name of the organization.
2. The place.
3. The date, with the day, month, and year.
4. The hour of issue.
5. The serial number of the order.

(b) Body.

The body of the order is divided into numbered paragraphs, each paragraph containing information of special nature.

The last paragraph should always contain instructions regarding the publication of the order.

(c) Ending. The ending contains—

1. The signature of the commanding officer.
2. The authentication of the order.
3. The distribution made of the order.

The contents of a sanitary order will depend upon the number of days in camp, the type of camp, and the strength of the organization.

Endeavor to be brief and concise in the wording of the order. In a temporary camp and for a small command, the sanitary order should cover only the salient points.

In the first paragraphs of the sanitary order outline the duties and the responsibilities, regarding sanitation, of the various members of the command, and then proceed to give explicit directions in regard to the sanitary measures to be employed and the type and number of "field expedients" to be constructed.

The order should be prepared by the senior surgeon as soon after arrival in camp as may be practical. It is then forwarded to the commanding officer for approval and issue to the command.

Following is an outline of sanitary order:

SANITARY ORDER
No. 6.

1ST INDEPENDENT BRIGADE,
U. S. MARINE CORPS,
Guantanamo, Cuba, 22 July, '22—10 a. m.

The following regulations for camp sanitation are published for the information and guidance of all concerned.

1. *Responsibility for sanitation.*—Commanders of all grades are responsible for police and sanitation, and for the enforcement of the provisions of these regulations within their organizations.

2. *Chief surgeon.*—The force surgeon is Commander — (MC), United States Navy, who is charged, under the commanding general, with the general conduct and supervision of the medical department of this command.

3. *Sanitary inspector.*—Lieutenant — (MC), United States Navy, is hereby appointed sanitary inspector and is charged with the general supervision of the sanitation of this command. Organization commanders will remedy defects reported to them with the least possible delay.

(NOTE.—The above should be used as a general form in the preparation of all sanitary orders. The following paragraphs may be modified.)

4. *Sanitary squads.*—Sanitary squads will be composed of men from the sanitary company of the medical battalion, assisted by civilians employed by the quartermaster. They will supervise oiling and draining of mosquito-breeding areas, water purification, central incinerator, etc.

5. *Surgeons attached to combatant organizations.*—Regimental surgeons and surgeons attached to other administrative units will inspect their camp once daily, or oftener if necessary. They will also arrange for a medical officer of the day, etc.

(Outline the activities of the dental department and arrange for a dental officer of the day.)

6. *Camp infirmaries and hospitals.*—State locations, hours for sick call, ambulance trips, evacuation of patients, etc.

7. *General police and quarters.*—Furl and strike tents once a week, air bedding, and other details regarding grounds, kitchens, mess tents, store tents, ventilation, etc.

8. *Personal hygiene.*—Bathing; venereal prophylaxis, where obtainable; foot inspections; clothing; etc.

9. *Water supply.*—Source of potable water; sterilization of water; sentry to be placed over water supply; necessity for economy in the use of water, etc.

10. *Food and messing facilities.*—Food to be protected from dust and flies; no hucksters to be allowed within the camp site; food inspections; use of uncooked vegetables; periodical examination of cooks and other food handlers; care of kitchens and mess halls.

11. *Waste disposal.*—(a) Garbage receptacles, how often emptied. Each regiment and the field hospital to construct one incinerator, give type, etc.

(b) Latrines: Type, number, and location. Arrange for night urinals.

(c) Manure: Burn over picket lines twice weekly; state method of manure disposal, etc.

12. *Anti-insect measures.*—(a) Flies: Screening of mess halls and kitchens, the use of fly paper, flytraps, etc.

(b) Mosquitoes: Oiling, draining, use of bed nets, etc.

(c) Other insects: Vermin, cockroaches, delousing, etc.

13. *Communicable diseases.*—For example: "Immediate isolation of suspects and contacts; report to this office for further instructions."

14. *Publication of order.*—For example: "This order will be read at the first formation and a copy will be placed on all bulletin boards."

By command of brigadier general:

/s/ _____,
Col. _____, U. S. M. C.,
Chief of Staff.

Official:

Major _____, U. S. M. C., *Adjutant.*

Distribution:

Chief of Staff, 1.

AC of S F-1, 1.

AC of S F-2, 1.

AC of S F-3, 1.

AC of S F-4, 1.

Commanding officer of each battalion, 1.

Regimental headquarters, 2.

File, 1.

HYGIENE OF THE MARCH.

The ability to march has always been—and the results of the World War tend to show that this is still true—one of the determining factors of victory. The superiority in marching ability of troops enables the responsible commander to secure the preponderance of men at the critical time and place.

Infantry, in spite of the rapid development of other branches of the military service, is still the dominant arm. Artillery without the defense of infantry is vulnerable. It is stated by some authorities that the well-trained infantry can endure longer marches than cavalry.

In modern warfare use has been made of mechanical transportation to effect great concentrations of men, but usually at the last moment, due to congestion of the arteries of traffic and to other causes of impassibility of the roads, there is a call for a test of physical endurance in marching.

In preparing for the Battle of the Somme on March 21, 1918, the Germans concentrated their troops by maneuvering them into position by long marches. For several months previous the German divisions were trained to endure long marches, and only five days before the battle many of the troops were far from the battle field, and some covered 60 miles in three nights of marching preceding the battle.

Preparation for the march.—The men should be trained in marching by increasing the length of the hike and the weight of the pack. They should be so trained for several months.

This training means the development of all the muscles in the body—an increase of the capacity of the lungs and heart, also strengthening of the foot arches and the like. It is at this time that the medical officer should keep close supervision over the men. Overtraining defeats our purpose and leads to cardiac dilatation and eventually to exhaustion.

There should be periods of mental and physical relaxation and recuperation.

It is remarkable how rapidly the human mechanism develops with progressive and systematic physical exercises. The raw recruit under proper supervision shows rapid development within a few months of training.

Start of the march.—The most suitable time to start a day's march is one hour after the break of day. Night marching should only be practiced when military necessity demands, and then should begin soon after sunset.

The canteens should be filled preferably the night before the march. The sick and physically unfit should be eliminated at the morning sick call.

A light breakfast is served—consisting of bread, oatmeal, tea or coffee, and perhaps some bacon, as the latter “digests slowly and thus gives staying power.”

When the men “fall in” there should be no delay in getting started, as standing around waiting acts as a mental hazard, which may upset the morale of the organization.

The sanitary officer, with a police detail, remains for a few minutes after the camp is cleared to see that all waste and litter is disposed of, and that the camp site is otherwise left in a clean and sanitary condition.

The march.—1. Length: The length of the day’s march is not measured by miles, but according to the condition of the roads, the weather, the pace, the weight of the loads, experience and physical condition of the troops, etc. Under average conditions 10 to 12 miles constitute a day’s march for a division or a brigade, and 20 miles per day may be regarded as a forced march.

2. Rate: The march should start with a slow rate of speed until the body is warmed to the point at which muscular action is most efficient.

The rate of a day’s march should not average more than $2\frac{1}{2}$ miles per hour (inclusive of halts.) To maintain this speed one hundred and twenty 30-inch paces are required per minute, which gives an actual rate of 3.46 miles per hour (exclusive of rest periods). This may be regarded as the most economical speed for experienced troops; for unseasoned troops and for long hikes, the most economical speed is a somewhat slower cadence than the above.

3. Halts: The first halt should be after 30 minutes of hiking, and should be for a period of 15 minutes’ rest. The object of the first halt is to permit the men to get their “second wind,” adjust shoe laces, rearrange packs, and to attend to the calls of nature.

The succeeding halts are made every 50 minutes and are for a period of 10 minutes’ rest, except the halt for the noon meal, which is for 1 hour.

During the rest periods the men should remove their packs and lie upon their backs. Their coats should be replaced and rebuttoned to avoid undue exposure to drafts and winds. An endeavor should be made to halt in cool and shady places, protected from strong winds. A place should be provided for the men to attend to the calls of nature during the rest periods—shallow trenches dug with a bayonet or sharp stick will suffice for this purpose.

4. March formation: If there is much traffic on the road the marching column should keep to the right and perhaps proceed in squad formation. If the circumstances permit it is much better to march in open ranks—half on each side of the road, which order tends to decrease the heavy devitalizing cloud of dust, foul odor, and

water vapor from perspiration—crowd poisoning—which tends to hang over close-order formation.

The march should be at "route step," thus permitting the men to take the lengths of step most adaptable to their physique. In order to vary the monotony of the "route step" marching, it is advisable to occasionally march "in step" for short periods.

The taller men at the head of the column are apt to set a pace uncomfortable to the shorter men marching in the rear of the column, and it is also easier marching at the head than in the rear, consequently the column should be reversed from time to time. The rear files as a rule expend about 6 per cent more energy than those at the head.

5. Food on the march: A light digestible breakfast is served before starting. A noonday meal is served when the day's march is two-thirds completed.

The rolling kitchen should have some warm soup or coffee prepared to serve to the men when they arrive in the evening camp.

The main meal of the day is the evening meal, which is to be served about an hour after the march is completed.

6. Morale: A fatigued body causes a hypersensitive state of mind which is more susceptible to any real or imaginary adverse stimulus. To inhibit the action of these stimuli calls for resourcefulness and leadership in company officers. One company under proper leadership will arrive in the evening camp, tired but happy, whereas another company not so fortunate in the selection of company officers is apt to come into camp tired, disgruntled, and dissatisfied.

Singing and whistling of popular tunes should be encouraged, as this distracts the minds of the men from their fatigued state, and is one of the surest means of preventing them from succumbing to exhaustion.

Straggling either from poor discipline or fatigue is always to be avoided, as it is depressing to the "morale" of the entire body of troops.

Clothing and equipment.—The maximum weight that a soldier can carry without serious loss of efficiency is said to be about 30 per cent of his body weight. The weight of a pack and equipment of the infantryman, United States Army, is about 48 pounds.

The equipment should be so arranged as not to restrict the expansion of the chest. The restriction of the expansion of the chest interferes with the action of the heart, due to the fact that the supplemental air is used instead of the complemental.

It is advisable in warm weather to unbutton the front of the shirt and to roll up the shirt sleeves.

The medical department on the march.—Before starting, the responsible surgeons should see that all sick and unfit are eliminated

and that the camp site is left in a sanitary condition, also see that the quality of water in the canteens is satisfactory and that foot disorders have been given the requisite attention.

1. The brigade surgeon: The brigade surgeon proceeds forward on the staff of the brigade commander.

2. The regimental surgeon: The regimental surgeon occupies a corresponding place in the regiment to the above, and the assistant regimental surgeon marches in the rear of the headquarters company.

3. The battalion surgeon: The battalion surgeon proceeds with the staff of the battalion commander, and the assistant battalion surgeon marches in the rear of the battalion. If there is only one surgeon assigned to a battalion, he should march in the rear of the unit.

The junior medical officers marching in the rear should occasionally proceed up and down the marching column of their organization and carefully observe the condition of the troops.

Soldiers suffering from the effects of fatigue may be dropped at the march collecting stations, ride in ambulances, or they may be allowed to proceed without their equipment—their equipment may be thrown upon one of the wagons of the train. All sick and injured patients should be properly tagged with the diagnosis tag and recorded. A compilation of these records is made at the end of the day's march.

4. The medical battalion: The medical battalion will proceed in two groups—one consisting of the mounted and foot group, which will march in advance of the animal-drawn train, and the other, consisting of the motor-drawn group, which will proceed at the head of the motorized train of the brigade.

5. March collecting stations: If the marching command is composed of a brigade or larger organization, it is advisable to establish march collecting stations every 3 miles. The personnel for these stations consist of two or more hospital corpsmen, who are equipped to give first-aid treatment to the sick, injured, and exhausted, and to retain the patients until they are picked up by the ambulances in the rear of the column.

The hospital corpsmen detailed for the purpose of establishing march collecting stations should proceed with the head of the column or advance party and drop off every 3 miles to form the collecting station. They remain until the tail of the column has cleared their station, then fall in with the rear units.

Water discipline on the march.—The exercise of walking, like other general muscular exercise, tends to elevate the body temperature, and an elevation of 1° to 3° may be regarded as normal to the marching soldier. In order to maintain the body at a constant

temperature, there must be some means of losing the heat which is generated by the contraction of the muscles used in walking. Nature makes provisions for this loss of heat by three methods, viz, evaporation, convection, and radiation.

Heat exhaustion is caused by lack of adjustment (thermolaxis) of heat production (thermogenesis) and heat loss (thermolysis).

The evaporation of perspiration is the chief method of thermolysis in marching—especially in a warm climate, where the surrounding air is almost as warm as the body.

To furnish a supply of water to take the place of the fluids lost in evaporation the marching soldier must consume a definite quantity of water.

The question of the quantity of water necessary to replace the above loss has been carefully worked out for average conditions of temperature and humidity.

In marching 1 mile a fully equipped soldier generates about 90 grams calories, which will require the evaporation of 180 mls of water to dissipate this heat. For 3 miles, or one hour of hiking, he will require 540 mls of water, which is a little more than 1 pint (473 mls), and for two hours of hiking the soldier will lose 2 pints of water, or the equivalent of one canteen of water.

It has been demonstrated that trained men can lose as much as 6 pints of water from the body, and that untrained men can lose at least 2 pints without causing any serious discomfort. Consequently it is a safe rule to permit men to lose 2 pints of water by evaporation before resorting to their canteens for drinking water.

Under average climatic conditions, the first drink of water should be at the end of about two hours of marching.

Here the man should sip slowly one-half the contents of his canteen (1 pint) and *thereafter 1 pint for every hour of marching*, inclusive of rest periods.

On hilly or muddy roads, and under tropical conditions, this allowance of water should be increased materially.

NOTE.—There appears to be a discrepancy in the estimate of the amount of water required for marching a given distance, as several authorities state that 1 quart is required for every $7\frac{1}{2}$ miles of marching. This discrepancy is perhaps due to the fact that British writers who were dealing in terms of imperial measure were quoted.

One pint apothecaries measure equals 473.17 c. c.

One pint imperial measure equals 591.46 c. c.

A marching soldier will evaporate approximately 1 pint of water (apothecaries measure) for every hour of marching (inclusive of rest) and this appears to be a safe rule to follow.

In addition to the amount of water consumed from the canteen, a pint or more is consumed with each meal.

The experienced soldier has instinctively determined the proper amount of water which his system will require; it is the raw recruit who is apt to "water log" his tissues, sweat profusely, and tire easily.

One type of thirst is due to dryness of the mouth, and to overcome this factor the men are advised to chew gum, or keep pebbles in their mouths, which promotes the flow of saliva and tends to allay this form of thirst.

Smoking on the march tends to increase thirst and should be limited to rest periods, or, as some authorities recommend, it should be prohibited during the march.

As a rule marching troops are accompanied by water carts containing potable water. It is most important that only pure water be used in the canteens, as the stomach of a marching soldier is apt to contain insufficient hydrochloric acid to destroy infective organisms.

The water needs of officers are slightly less than those of men, because their equipment is lighter, and marching to one side requires less work than men marching in ranks.

Selection of a camp site.—Toward the end of a day's march a staff officer, a medical officer, and an engineer officer or a quartermaster should ride forward and select a camp site, unless this has been previously arranged for.

The functions of the medical officer are purely advisory.

In time of war tactical consideration is of primary importance in the selection of a camp site.

It is impractical to locate an ideal camp site which will be entirely satisfactory from a medical viewpoint, hence the medical officer must consider the "pro and contra" of the available locations.

POINTS TO BE CONSIDERED IN DETERMINING THE LOCATION OF A CAMP.

Favorable considerations.	Unfavorable considerations.
1. Accessibility to a supply of good water, fuel, and forage.	1. Sites recently occupied by other troops, allowing two months' vacancy as an arbitrary standard.
2. Sandy loam or gravel soil.	2. Dry bed of river, ravines, and base of hills if there is likelihood of rain.
3. Elevated site, well drained, such as sloping plateau.	3. Clay, alluvial, or dusty soil.
4. Shade trees as a protection from the sun's rays in warm weather.	4. Proximity to marshes, swamps, and other mosquito-breeding areas.
5. Hills and forests acting as windbreaks in cold weather.	5. Steep slopes.
6. The location selected should be large enough to accommodate the troops, and crowding should be avoided.	6. Sites where the ground water is near the surface.
7. Grass-covered location.	7. Proximity to native habitations especially in malarial regions.

Flexion marching.—This refers to a type of marching, "marche en flexion," developed by the French. According to advocates of this system, it is possible for a soldier using this method to cover some distance at a speed as great as 6 miles per hour; others deny any special advantages.

In flexion marching the knees and body are slightly flexed and the soldier has the attitude of leaning forward.

FIELD MEASURES FOR INSECT CONTROL.

The human race is, so to speak, at constant warfare with hordes of visible enemies—insects—which frequently act as carriers of myriads of invisible foes—pathogenic microorganisms and ova of parasites. This is especially true of conditions in the field, and for an expeditionary force to withstand successfully the attacks of insects requires detailed consideration of field measures for insect control.

TABLE OF COMMON INSECTS.

Common name.	Species.	Common diseases transmitted.	Breeding places.	Life history.	Range of flight.
Flies.....	Musca domestica.	Typhoid fever, cholera, dysentery, diarrhea, smallpox, erysipelas.	Manure, garbage, decaying organic matter.	Eggs hatch out in 12 to 24 hours into larvæ. Larvæ grow rapidly and in 4 to 6 days become pupæ (resting stage). In 2 to 4 days mature into adults.	Several miles.
Mosquitoes.	Anopheles.	Malarial fever.	Rural stagnant pools, among grass and rushes, swamps and marshes.	Ova deposited in mass of 250 eggs; in 2 to 4 days hatch into larvæ, and in a week reach pupæ or wingless resting stage. In 2 or 3 days develop wings and become adult mosquitoes.	One-half mile, usually against the wind.
	Stegomyia.	Yellow fever..	Domestic; develop in water in any container near a house or in gutters, cisterns, spouts, etc.	Female lays about 70 eggs. Larvæ hatch out in 2 days and develop into pupæ in 1 week. Then in 2 or 3 days become mature adults.	Maximum of 75 feet; usually hide in nooks away from wind.
Lice.....	Pediculus..	Typhus fever, relapsing fever.	Breed and spend their entire life on warm-blooded animals, including man.	Eggs cling to hair or clothing of host (man). They hatch out in 3 to 4 days and mature in 10 to 15 days.	Do not travel much; keep close to one host.

Flies.—The havoc created by the flies in the dissemination of typhoid-fever germs in camps during the Spanish-American War is well known. A veteran officer of that war takes delight in telling the story that flies were so prevalent around the lime-covered latrines and the mess halls that the use of lime in the latrines was eventually abandoned on account of the fact that the food served at the mess had a limelike flavor.

Habits of a fly: A fly will go upward through a hole, but seldom downward, hence this fact is utilized as a principle in the construction of some flytraps.

Flies endeavor to avoid strong sunlight and tend to congregate in shady places or in room light. They likewise avoid a dark place, hence lampblack is used as a fly deterrent to cover the interior of latrines.

These insects have a tendency to rest upon vertical rather than horizontal objects; they also prefer curved surfaces rather than plane surfaces. The latter two facts are utilized to catch the adults by suspending curved strips of flypaper from the ceiling.

Flies tend to select certain colors and shades of color.

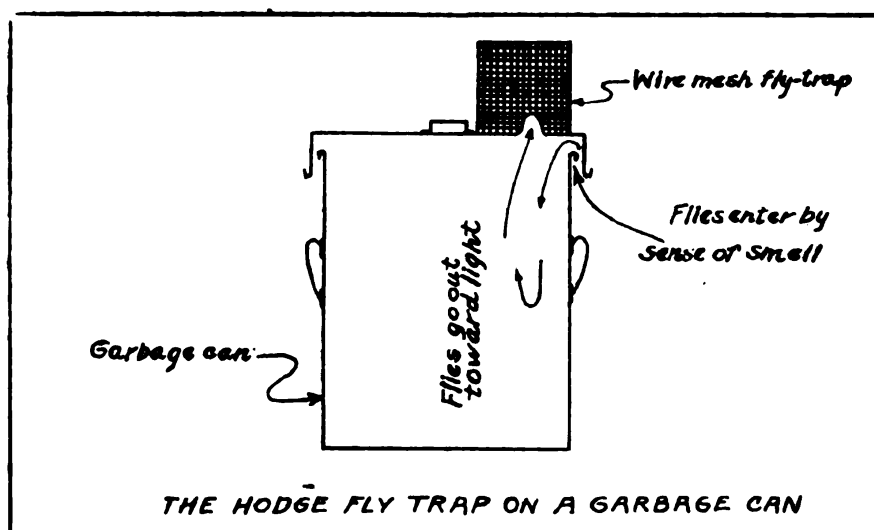


FIG. 23.—The Hodge fly trap.

In conducting a series of experiments at Quantico, Va., by placing baited flytraps in the center of large squares of plaster board, each square painted a different color, the following deductions were made from the relative number of flies caught in the respective flytraps:

- (a) Flies prefer a lighter shade to a dark one of the same color.
- (b) Flies have a tendency to avoid blue colors. (I have subsequently learned that this fact was taken advantage of by painting the interior of living quarters blue.)

Flies can travel long distances—100 miles or more.

Temperature of 120° F. is usually fatal to flies; they are most active at a temperature between 80 and 90° F. and are torpid at 50° F.

Flies feed entirely upon liquid food; when they attack a solid—like sugar—the regurgitation of fluid from the crop serves to make a solution.

Antimusoid measures.—Measures undertaken to combat flies may be divided as follows:

1. Prevention of access.
 - (a) Food protection.
 - (b) Personal protection.
2. Destruction of the adult fly.
3. Prevention of breeding.

1. Prevention of an access of flies: Filth attracts flies. Cleanliness may be considered, in a negative manner, as the chief deterrent to the presence of flies.

It may be accepted as a maxim that: *The presence of an undue number of flies is indicative that food or filth is present somewhere in the vicinity.*

A marked reduction in the number of flies around a kitchen follows the simple measure of cleaning the outside of garbage cans.

In the morning inspection of a dozen or more kitchens it is very evident that the number of flies varies directly with the degree of cleanliness of each place.

2. Screening: In a permanent camp the kitchens, mess halls, and garbage cans should be screened. In a semipermanent camp screening may be impractical, consequently we must depend upon cleanliness and insect-proof containers.

3. Leaking screens: Unless the screening of a building is maintained in an efficient state, the use of screens are apt to do more damage than good. I have seen persons living in quarters, enjoying a false sense of security by the mere presence of screening, yet the interior of the building was infested with more flies than it would have been if the screens had been removed. Leaking screens (especially cracks around the screen door) frequently convert the building into a "huge flytrap"—flies are able to gain entrance into the building through leaking screens but are unable to get out.

Screen doors should be made to open outward and should be in direct sunlight, when practical.

During the malarial season in Quantico, Va., a man designated as the "screening inspector" was assigned to each organization. His duty was to inspect screens at regular intervals and to repair faulty screens. One of the places most apt to be overlooked is the space between the bottom of the screen door and the floor, a defect which may be remedied by using extra battens. Some of the other faults to be looked for include torn screens, warped doors, improperly closing of doors, broken door stops, etc.

4. Repellants: The use of essential oils as fly deterrents is unsatisfactory. Crude oil may be used around latrines to repel flies, and coating the interior of latrines with lampblack serves the same purpose.

Destruction of adult flies.—1. Muscicides: Solutions of formaldehyde 1 per cent (corresponding to 2.5 per cent of a 40 per cent solution of formalin), or sodium salicylate 1 per cent will kill flies. As flies usually drink in the early morning it is well to prepare the above solutions the night before.

A bucket containing about 1 quart of gasoline may be passed under flies at rest on the walls and ceilings of living quarters; the fumes of the gasoline will stupefy them, causing the flies to drop into the bucket.

Directions for using salicylate and formaldehyde solutions are as follows: A glass tumbler nearly full of the solution selected to be used is employed; a piece of blotting paper is placed over this; the blotting paper is cut circular and somewhat larger than the tumbler; a saucer is then placed over the blotting paper. The whole device is now inverted and a small stick such as a match is inserted under the edge of the glass to permit access of air. The blotting paper will remain in the proper moist condition until the contents of the glass tumbler have been used. A little sugar may be sprinkled upon the paper, which may increase the attractiveness of the solution for flies; too much sugar must not be used.

2. Fly paper: Fly paper is very efficient for catching flies and is prepared as follows: Heat powdered resin eight parts and castor oil five parts (by weight); stir well while heating; the mixture should not be brought to a boil. In hot weather the proportion of resin should be increased. Sugar or honey may be added, but is not essential. The fluid is spread while hot over glazed paper. The mixture may be painted upon iron hoops or wire strands. Wires so painted will last for two or three days, when they should be cleaned and recoated.

3. Flytraps: Flytraps consist of wire cones, glass-bel' traps, and many other varieties.

Flytraps are constructed on the principle that flies are attracted by the sense of smell through a dark opening in the bottom or at the side of the trap; after feeding they attempt to leave by flying toward the light and thus into the trap.

Traps should be lifted a certain distance from the ground so as to allow free access to the flies and should always be baited with some attractive odorous substance. Molasses in water (molasses 1 part to 3 parts of water) or brown sugar (1 part of brown sugar to 4 parts of water) may be used as bait for flies. Both the above solutions increase in attractiveness when fermented.

*The Ober flytrap.*²—"This flytrap is in no sense new in principle, since it is substantially identical with some of the commer-

² Quoted, by permission, from the lectures of Maj. M. C. Stayer, Medical Corps, U. S. Army, Army Medical Field Service School.

cial forms. It is, however, in our judgment, by far the most readily constructed of any of them and the method of construction is such as to require practically no tools other than a saw and a hammer. Two boards of equal width, best 11 or 12 inches, are laid off into triangles. Each pair of triangles form the ends of a trap and these ends are connected by three sticks of wood of any desired length. The usual way is to cut them of such a length that the wire screening that is available will just reach. If 36-inch screening is used

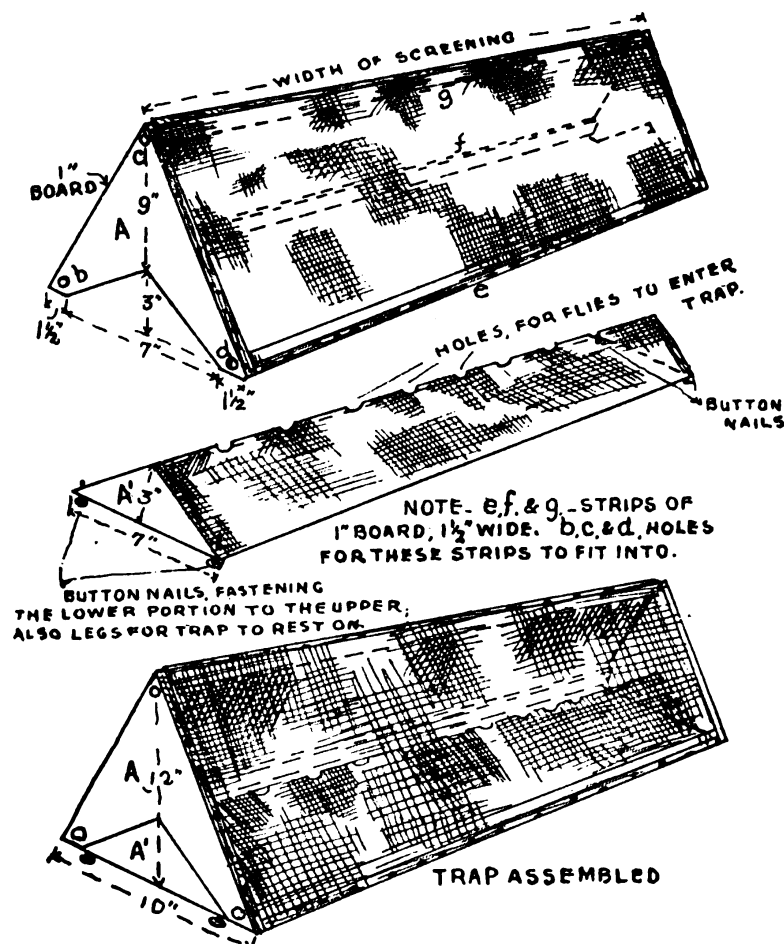


FIG. 24.—Fly trap designed by Lieut. B. F. Ober, M. O. R. C., U. S. Army. From "Manual for Medical Officers," by Moss and Woodbury. George Banta Publishing Co., Menasha, Wis..

it may be cut in two and an 18-inch trap be thus made. A small triangle is cut out of the base of each of the ends as shown in the drawing. Beginning at the base, the netting is tacked onto the top of this smaller triangle, then onto the outer side of the base and around over the top of the trap and down to the starting point. One of the smaller triangles is nailed back on again, after the wire is tacked onto it. The other triangle is not nailed, but is held in place by two small wood or iron buttons. At the angle formed

by the apex of the small triangle small holes are made by pushing a lead pencil through the screen at intervals of about 1 inch. A nail or screw is placed at each corner of the base so as to raise the trap a quarter or three-eighths inch off the ground. The bait is placed under the trap and the fly, when it finishes feeding, crawls up through the openings into the trap. Nothing can be simpler than the construction of this little trap, it being far easier to build than a box-shaped trap and requiring much less lumber. Its efficiency is not different from any other trap of similar size.

"The ease of building is seen when it is stated that several hundred of these were built with ordinary fatigue details in a very few days at the Fort Riley laboratory. To remove the flies all that is necessary to do is to turn the two buttons holding the loose triangle in place, to depress this latter slightly and, on raising the other end of the trap, the flies slide right out, being directed to the opening by the screen wire. It can be emptied in a very few seconds with very much less trouble than any other trap which we have seen."

Judging from the experiments conducted by one observer it would appear that the efficiency of flytraps is largely dependent upon the bait used in them. In these experiments 15 different kinds of bait were used and a total of 45,000 flies were caught.

The following are the results of 7 of the 15 types of bait used; the results from the other 8 kinds of bait are omitted for sake of brevity:

Kind of fly bait.	Per cent of total flies caught.
Fish head.....	31.34
Overripe bananas.....	21.30
Bran mixture.....	20.72
Canned salmon.....	14.00
Molasses, water, and vinegar.....	1.00
Sweet corn.....	.13
Mashed cheese and molasses.....	.10

Fermentation or putrefaction is almost an essential factor for a good fly bait. Flytraps should be placed upon a white surface, as a white surface is more attractive to flies than a dark one.

4. Fly swatting: Flies gaining access to kitchens and mess halls should be killed by swatting with fly swatters. Fly swatters consist of a piece of wire mesh, leather or rubber, tacked to a long handle. When rubber or leather is used it should be well perforated. The free edges of the wire mesh may be covered with leather if so desired.

Prevention of fly breeding.—Flies breed in horse manure, excreta, decaying organic matter, etc. "One neglected stable may supply a horde of flies for an entire district."

Garbage should be kept in covered containers to prevent fly breeding, and should be removed frequently, especially in warm weather.

"The suppression of flies resolves itself simply into a matter of cleanliness—organic cleanliness of the environment."

Grease traps must be kept covered and the surroundings kept clean and dry or larvæ will develop there.

The proper care of the picket line is a difficult problem. Daily removal of the manure with cleaning of the picket line and burning over the area are only partially effective measures in the prevention of fly breeding. The heat of burning over the surface only penetrates from 1 to 2 inches of the ground and fails to kill the developmental forms which may be several inches beneath the surface. Digging up the picket line and saturating it with crude oil and tamping it down is fairly satisfactory.

Mosquitoes.—The field measures undertaken to combat the activities of the mosquito in the transmission of disease may be classified as follows:

1. Medicinal prophylaxis.
2. Culicifuges or deterrents of mosquitoes.
3. Personal protection, including,
 - (a) Screening.
 - (b) Sleeping nets.
 - (c) Head nets.
 - (d) Gloves, etc.
4. Mosquito destruction:
 - (a) Adult mosquito.
 - (b) Developmental or aquatic forms.
 - Chemicals:
 - Oiling.
 - Other larvicides.
 - Drainage.
 - Destruction by fish.

5. Proper location of camps (biological barriers).

1. Medicinal prophylaxis: It appears to be the generally accepted opinion that the routine internal administration of quinine as a prophylaxis against malaria is of questionable value, but that the treatment of malarial carriers with quinine is an important factor in the prevention of this disease.

2. Culicifuges: Kerosene is extensively used in some of the tropical countries as a repellant to mosquitoes, and some of the essential oils, such as oil of citronella, have been used (one part of oil of citronella to four parts of vaseline). These oils have little practical value in the field, as their effect will not last through one night.

Light shades of color, especially yellow, are repellant to anopheles mosquitoes, dark shades are preferable, especially navy blue. The stegomyia mosquito prefers a dotted white surface.

3. Personal protection: Screening of living quarters in permanent camps may be utilized by using wire mesh having 16 meshes to the inch for anopheles—18 meshes to the inch must be used when screening against stegomyia mosquitoes.

The female mosquito, which is nocturnal in its feeding, transmits the malarial germ, consequently *sleeping nets* are our chief means of reducing the possibility of the transmission of this disease to troops on field duty. This article of equipment is supplied by the United States Marine Corps to every individual of an expeditionary force. If the circumstances warrant, all sentinels after sunset should wear head nets and gloves.

4. Mosquito destruction: The adult mosquitoes may be killed by fumigation—burning 2 pounds of sulphur for each 1,000 cubic feet of space.

Mim's culicide consists of equal parts (by weight) of carbolic-acid crystals and gum camphor. The acid is slowly melted and then poured over the camphor, thus forming a clear volatile liquid. Volatilize 3 ounces of this mixture for every 1,000 cubic feet of space.

Mosquito traps and swatters are sometimes used for the destruction of adult mosquitoes. Destruction of the wintering adults is said to be very effective in reducing malaria.

5. Destruction of the mosquito in the developmental stages: Mosquito-breeding areas may be controlled by oiling. Crude petroleum is the oil usually selected. When the mosquito larvæ, commonly called the wiggletail, comes to the surface for air the oil clogs their breathing apparatus and kills them by asphyxiation.

About one-half ounce of oil suffices for every square foot of water surface under normal conditions, e. g., small areas where the wind does not blow the oil aside. The application of this amount of oil once a week is sufficiently frequent to destroy each crop of larvæ. It requires 10 or more days for the cycle—from the egg to the adult mosquito.

There are several different methods for oil distribution upon water surfaces.

The "knapsack sprayer" is a well-known means of oil distribution, and is often utilized.

The "Panama dripper" consists of an oil can with a faucet near the bottom which allows the oil to fall on the water, drop by drop (usually at the rate of about 30 drops per minute), and furnishes a means of continuous oiling of a running stream.

The "submersible oil bubbler" devised at Quantico, Va., acts similarly to the above, except that the device is completely submerged

and the oil comes from below upward. The advantage of this method is that the device is less apt to be interfered with by unauthorized persons and the flow of oil tends to be more uniform and less affected by a change of temperature. These cans were removed and refilled once a week.

The "oil-soaked sawdust" method of petrolization (also originated at Quantico, Va.) affords a simple means of distributing oil over mosquito-breeding areas. This method was worked out contemporaneously and independently by the United States Public Health Service. The oil-soaked sawdust is placed in a wire cage or in perforated boxes which are partially embedded in running streams. The cages were found to be effective without renewal of the oil for a period of from two to three weeks.

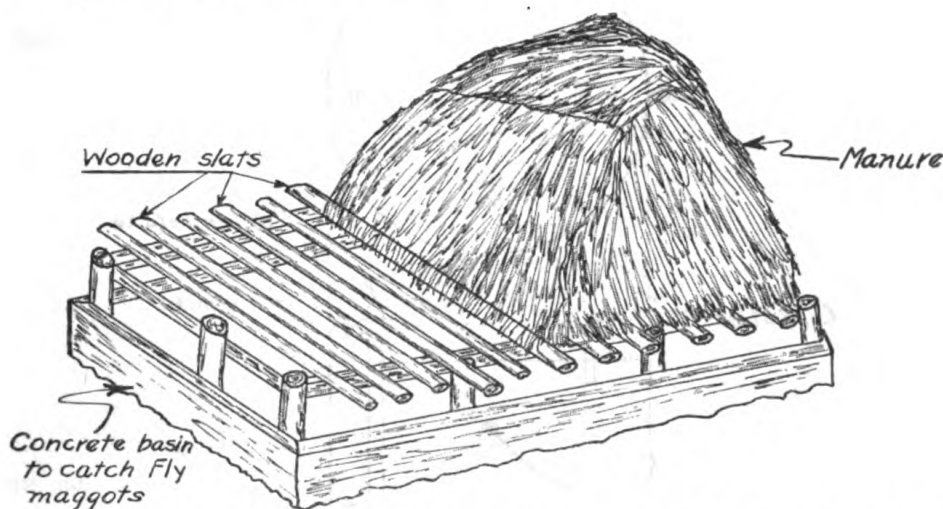


FIG. 25.—Larvæ fly trap. The flies lay eggs in the pile of manure and the larvæ, in an attempt to find earth in which to pupate, burrow through the pile and fall through the slats into a concrete basin of water.

Where there is dense surface vegetation, such as water lilies, the oil-impregnated sawdust may be thrown at random among the vegetation and floatage; each individual particle becomes a means of slowly liberating oil. (Vide Military Surgeon, November, 1918, for more complete details of the last two methods.)

The Panama larvicide consists of carbolic acid, rosin, and caustic soda, combined in such a manner that the product has approximately the same specific gravity as water. This larvicide has the advantage over oiling inasmuch as it kills the larvæ of one species, *Mansonia titilans*, which does not come to the surface of the water, but gets its air from the roots of water plants. One part of this preparation to 5,000 parts of water will kill larvæ.

Other chemicals, some of which are by-products in the manufacture of gunpowder, have been employed as larvicides.

6. Drainage and filling: Where the mosquito-breeding area is below sea level and can not be drained, it may be flooded with salt water to prevent breeding. In other undrainable areas deep canalization may be used to reduce the water surface to a minimum, which may then be easily controlled by oiling.

At Quantico, Va., one of the swamps below high-tide level was controlled by canalization, and by using a one-way floodgate which permitted the egress of the water during low tide. Another similar swamp was controlled by fish-bone drainage and the construction of

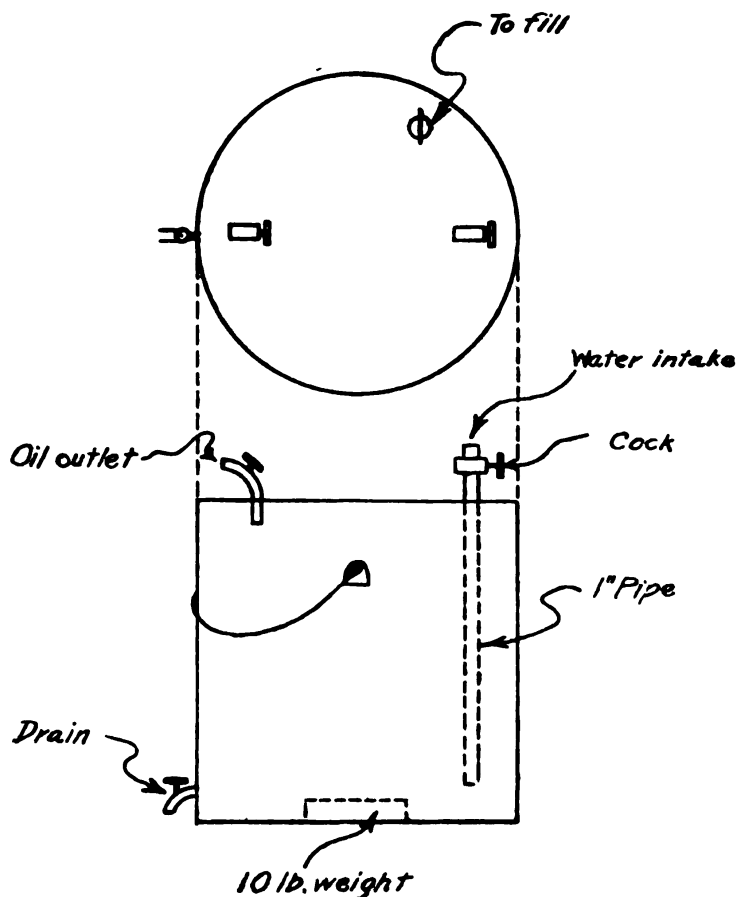


FIG. 26A.—Ebert's submersible automatic oil bubbler.

a dam with a sump at the junction of the central canal with the river; the water of the swamp was exhausted by means of a gasoline pump.

In draining an area as few drains as possible should be made. They should have straight courses and clean-cut steeply sloping sides and narrow bottoms. If necessary, laterals may be run into the main ditch, so-called "fish-bone" drainage. The laterals should join the main ditch at an acute angle in order to lessen the deposit of dirt and débris. Frequent inspections and constant repair are necessary for the proper maintenance of the drainage system.

In a permanent camp subsoil drainage is preferable, the cost of which is about 20 cents per foot.

Small swamps, marshes, etc., may be filled in with dirt, ashes, refuse, etc.

A comparatively small amount of stagnant water will furnish sufficient breeding area to infest a small camp with mosquitoes.

All tin cans, broken bottles, and other receptacles which will retain water should be immediately disposed of. A well-recognized authority on mosquitoes informed the writer that he was unable to locate the source of infestation of an isolated dwelling house until he discovered a broken rubber ball containing water, the removal of this breeding place was followed by a reduction in the number of mosquitoes at this place.

Certain vegetation serves to harbor the adult mosquito and may furnish breeding places after rainy weather. On one occasion the

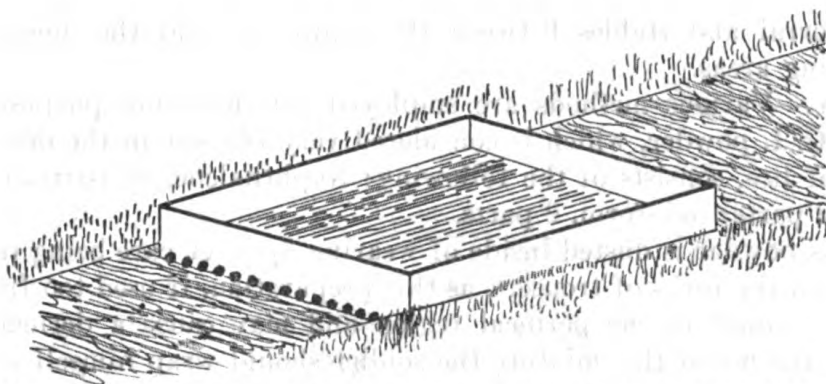


FIG. 26B.—Method of petrolization with oil-soaked sawdust devised by Lieut. E. C. Ebert, M. C., U. S. Navy.

source of mosquito breeding proved to be a plant called "elephant ear"; mosquitoes appeared in swarms with the introduction and disappeared shortly after the removal of this plant.

Certain species of fish have been successfully used in cisterns, wells, and ponds to destroy the developmental forms of mosquito.

7. Proper location of a camp: A camp located about a mile from mosquito-breeding areas is considered fairly safe from anopheles.

Le Prince has shown that anopheles occasionally will fly as far as a mile from breeding places, and also that under certain conditions this species tends to fly *against* the wind, which fact opens the technical question whether the camp should be to the windward or leeward of the breeding places. They are unable, however, to fly against a strong wind.

In the selection of a camp site one should endeavor to avoid the proximity of habitations, as these dwellings are apt to harbor mosquitoes and also malaria carriers.

8. Biological barriers: It has been demonstrated that anopheles do not travel far from breeding places if a food supply is close by, and this fact is taken advantage of in the use of "biological barriers."

In Quantico, Va., there were undrainable—and otherwise uncontrollable—mosquito-breeding swamps to the north and to the south of the cantonment. On inspection anopheles were found to be very abundant in the stables to the northward of the camp, whereas the adjacent part of the cantonment was comparatively free of anopheles when compared to the southern edge. Shortly after placing a pigpen to the south there seemed to be a reduction in the number of anopheles in the southern portion of the camp and large numbers were found in the pigpen. The camp was protected from mosquitoes by "biological barriers," so to speak, which tended to stay the flights of mosquitoes in their search for food.

Hence it does not seem improbable that the use of animals as "biological barriers" may be put to practical advantage by establishing the corral and stables between the camp site and the mosquito-breeding areas.

Lice.—Various methods are employed for delousing purposes.

N. C. I. powder, which is considered very efficient in the destruction of lice, consists of the following: Naphthalene, 96 parts; creosote, 2 parts; iodoform, 2 parts.

This powder is dusted inside of wearing apparel, care being taken to avoid the forks of trousers, as this preparation, if used too freely, is an irritant to the perineal region and may cause a dermatitis. After the use of this mixture the soldier should wrap himself up in a blanket so as to retain the fumes which are generated.

Vermijelli is less irritating than the above mixture and is composed of the following ingredients: Crude mineral oil, 9 parts; soft soap, 5 parts; water, 1 part.

This preparation will kill adult lice, but has no effect upon the eggs.

Clothing may be deloused by immersion in kerosene or gasoline.

Ironing of clothes will kill both the adults and the eggs; steam heat will accomplish the same purpose. The "Serbian barrel" and the "sack disinfector" are two simple methods of using steam heat in the field.

The Serbian barrel disinfector consists of a removable barrel with a perforated bottom and a tightly fitting cover which is weighted down with stones. The barrel is placed over a tank of boiling water; the steam generated from the boiling water flows under pressure into the barrel. The water must be kept boiling at all times while this barrel is in use.

Clothes and other articles may be disinfected and disinfested by the above means. The "sack" disinfector devised by Lieut. Col. P. S.

Lelean, R. A. M. C., depends upon the principle that steam entering the upper portion of the inverted bag displaces the air in its course downward and produces an extra atmospheric pressure (about 15 pounds per square inch) which pressure in turn raises the temperature of the interior of the sack to 107° C.

The sack disinfector is useful for disinfection and disinfestation.

For a detailed description of this device see United States Naval Medical Bulletin for September, 1922.

Head lice: For the destruction of the head louse (*Pediculus capitis*) acetic acid (10 per cent solution) is applied. Equal parts of kerosene and olive oil are sometimes employed in place of the acetic acid solution. The hair should be combed with a fine-tooth comb.

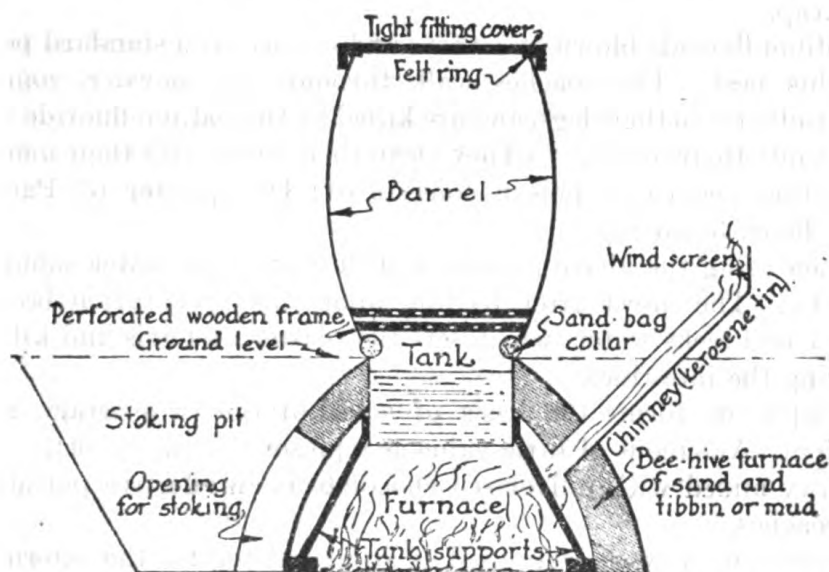


FIG. 27.—Serbian barrel, cross section. From "Sanitation in War," by P. S. Lelean, P. Blakiston's Son and Co., Philadelphia.

Public lice: Methods for the destruction of this louse are well known and will not be considered here.

Bedbugs: There are two species of bedbugs, namely, the *Cimex lectularius* and the *Acanthia rotundata*. The *Cimex lectularius* is the common bedbug found in northern climates, while the *Acanthia rotundata* is found in tropical regions.

The eradication of this parasite, especially in tropical regions, is a very difficult problem.

Fumigation with hydrocyanic-acid gas is effective in the extermination of bedbugs, but is dangerous when performed by unskilled persons.

The blow torch is effective when applied to cracks of metal beds.

Kerosene, gasoline, and other chemical insecticides may be poured into crevices to exterminate this pest.

In the Canal Zone the cots were immersed in a solution of caustic soda for a period of 15 minutes (strength of the soda solution is that which is usually employed in the washing of clothes). After immersion they were washed in clear water and allowed to dry in the sun. This method is said to kill both the adults and the eggs.

Cockroaches.—There are four domesticated species of this family, namely, the Oriental, German, American, and Australian roach.

It is claimed that cockroaches may be caught by the use of a trap which consists of a deep, smooth jar with a stick on the outside serving as a runway leading to the mouth of the jar. Cockroaches walking up this runway slip when they reach the top, thus falling into the jar; sweetened meal and other foods are used as bait for this trap.

Sodium fluoride blown in corners and crevices is a standard poison for this pest. The roaches walk through this powder, some of which adheres to their legs, and are killed by the sodium fluoride when it gets into their mouths. (They clean themselves with their mouth.)

Another cockroach poison consists of: Dry plaster of Paris, 1 part; flour, 3 parts.

When using the above mixture a dish containing water should be close by. The insect after feeding upon this preparation becomes thirsty and seeks water, which sets the plaster of Paris and kills by clogging the intestines.

Phosphorus forms the basis of some of the proprietary roach powders. Arsenic is of little value as a poison for this insect.

Borax mixed with pulverized chocolate is an effective poison for cockroaches.

Pyrethrum is extensively used as an insecticide for the extermination of cockroaches and other insects.

AN OUTLINE OF SOME OF THE FUNCTIONS OF A BRIGADE MEDICAL DEPARTMENT AND A SUGGESTED METHOD OF THE DISTRIBUTION OF THE PERSONNEL AND THE MATERIAL IN COMBAT.

The medical personnel serving with an independent infantry brigade, United States Marine Corps, has been classified as follows:

(a) Attached medical troops (regimental and other medical detachments).

(b) Medical battalion.

The attached medical troops of a brigade consists of: Medical officers, 19; hospital corpsmen, 71.

The medical battalion, independent infantry brigade, United States Marine Corps, is composed of:

	Officers.	Enlisted men.
Battalion headquarters.....	4	3
Service company.....	4	39
Sanitary company.....	1	35
Ambulance company.....	1	20
Hospital company.....	8	55
Total.....	18	152

The material mentioned is based upon the items contained in the proposed revision of the Field Supply Table, Medical Department, United States Navy. In order to be able to interpret this outline, it may be stated that the first nine items of the new Field Supply Table, soon to be published, will probably consist of the following:

1. Equipment, individual, medical officer.
2. Equipment, individual, dental officer.
3. Equipment, individual, hospital corpsman.
4. Equipment, individual, dental assistant.
5. Battalion chest, medical.
6. Battalion chest, surgical.
7. Battalion case, battle dressings.
8. Crate, litters.
9. Case, blankets.

It is impracticable to define specifically the proper functions and locations under varying field conditions—such as the character of the terrain, length of the lines of communication, etc.—of the different battle stations of the medical department; consequently the following remarks are intended as suggestions and must not be regarded in any manner as mandatory.

As one naval medical officer so well expressed it:

“In the field the distribution of medical supplies, prompt evacuation, skillful first aid, shelter, food, and restoratives available early for every fallen combatant are of infinitely more importance than *highly technical relief to difficult cases.*”

Company aid—post.—

Personnel: 1 hospital corpsman as field dresser.

Equipment: Item 3 in “crisis expansion” with 6 dressings from item 7.

Location: Front line with each combatant company.

Fractures: Immobilized with improvised splints.

Hemorrhage: Tourniquet, plugging, and bandage compression.

Shock: Allay fear; give water from canteen.

Gas: Cyanotic type—phlebotomy.

Evacuation: By litter bearer group from battalion dressing station.

Battalion dressing station.—

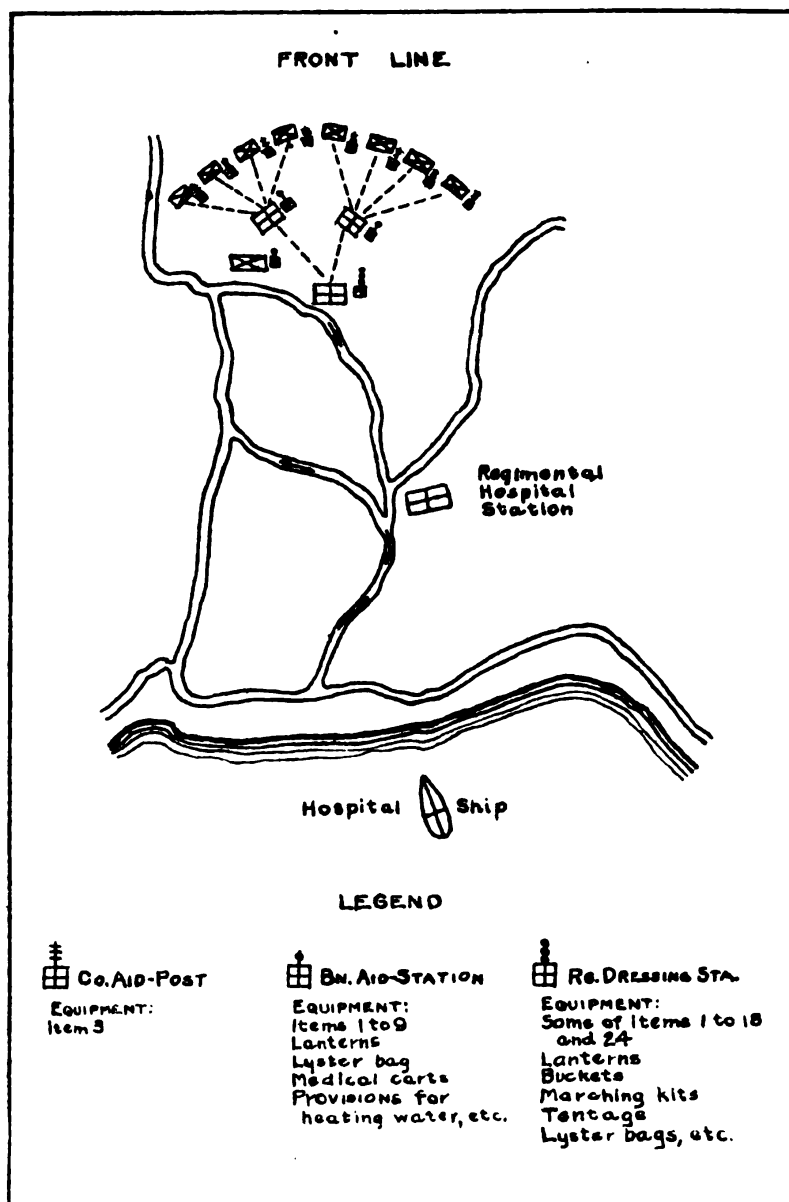


FIG. 28.—Schematic representation of the activities of the medical department of an independent infantry regiment in combat.

Personnel: Attached medical troops consisting of 2 medical officers and 5 hospital corpsmen, with additional litter bearers detailed from other sources.

Equipment: Items 1 to 9 inclusive. Lyster bag or 15 canteens filled with water, lanterns, flags for dressing station, provision for heating liquids, tent fly.

Location: Depends upon the terrain and available shelter, usually about 300 to 700 yards to the rear of the firing line.

Functions: Record patients, verify diagnosis tags. Apply or readjust dressings and splints. Administer antitetanic serum. Administer morphine hypodermatically when required.

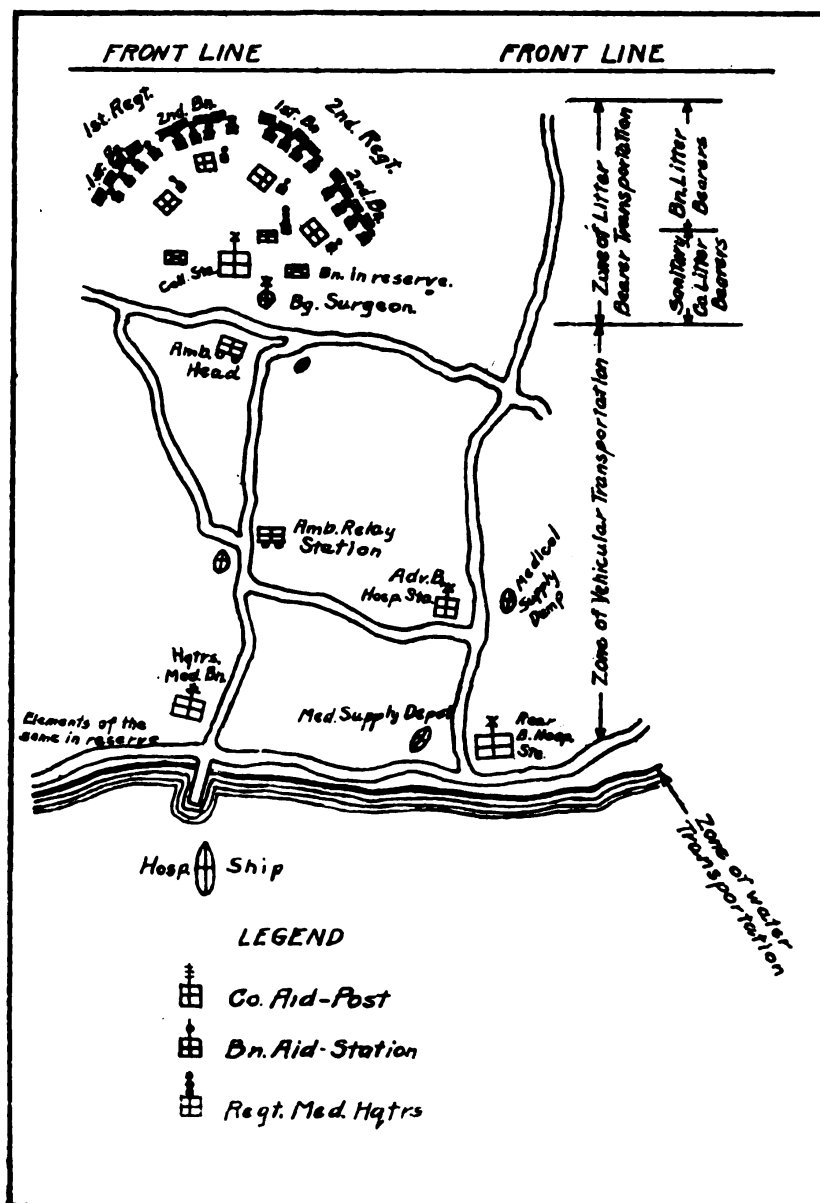


FIG. 29.—Schematic representation of a suggested method of the distribution of a brigade medical department for combat and the means of the evacuation of the sick and wounded and of the transportation of medical and surgical supplies to forward areas.

Shock: Sustain morale, give hot alkaline solution internally, rapid evacuation.

Gas: Alkaline lavage.

Evacuation: By litter-bearer group from collecting station.

Regimental medical headquarters.—

Personnel: 1 regimental surgeon; 1 assistant regimental surgeon (as a stand-by relief for the first casualty to medical officers); 5 hospital corpsmen as messengers to maintain contact with the battalion surgeons, brigade surgeon, and other duties.

Equipment: As required.

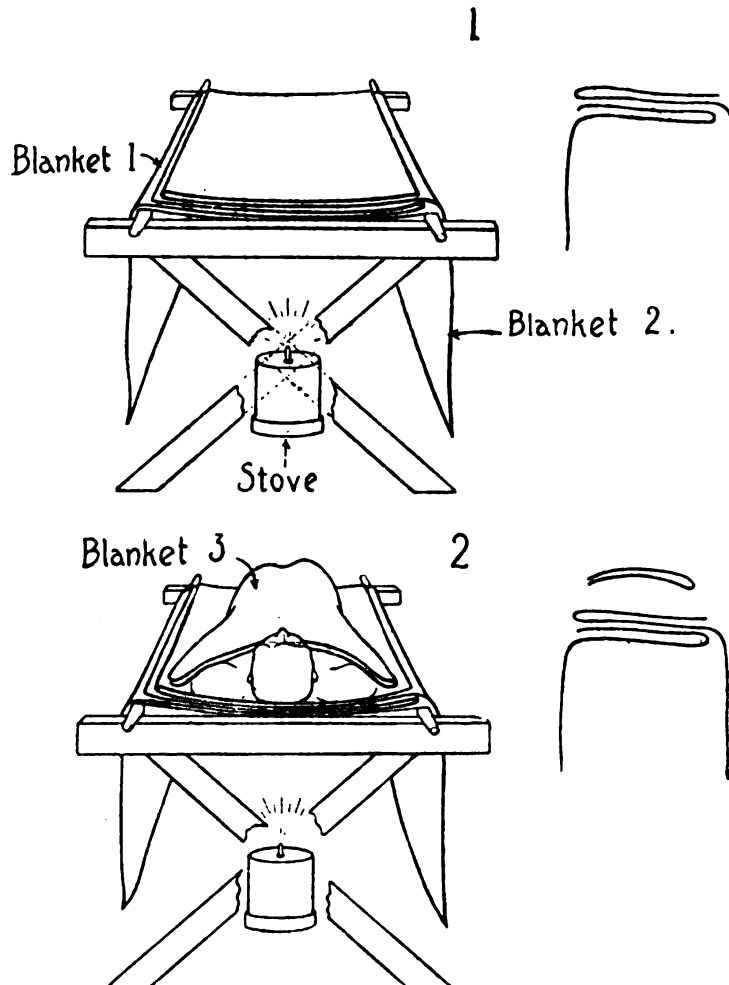


FIG. 30.—Dressed litter, preliminary steps. Three blankets used. (Manual of Splints and Appliances, Am. Red Cross, 1918.)

Location: Vicinity of the regimental headquarters.

Functions: Administration and tactical, little or no provision for the treatment of the sick and wounded.

NOTE.—With a regiment operating independently this group should be equipped and should also function similar to a collecting station, and possibly as an advance hospital station.

Collecting station.—

Personnel: Sanitary company of the medical battalion.

(a) Collecting-station group.

(b) Litter-bearer group.

(c) Additional litter bearers as needed to be assigned from other units for this duty.

Equipment: Items 1 to 9, inclusive, and items 14 and 17. Hospital tent flies; lanterns; provision for heating water; Lyster bag, or 30 canteens filled with water; flags for station; buckets.

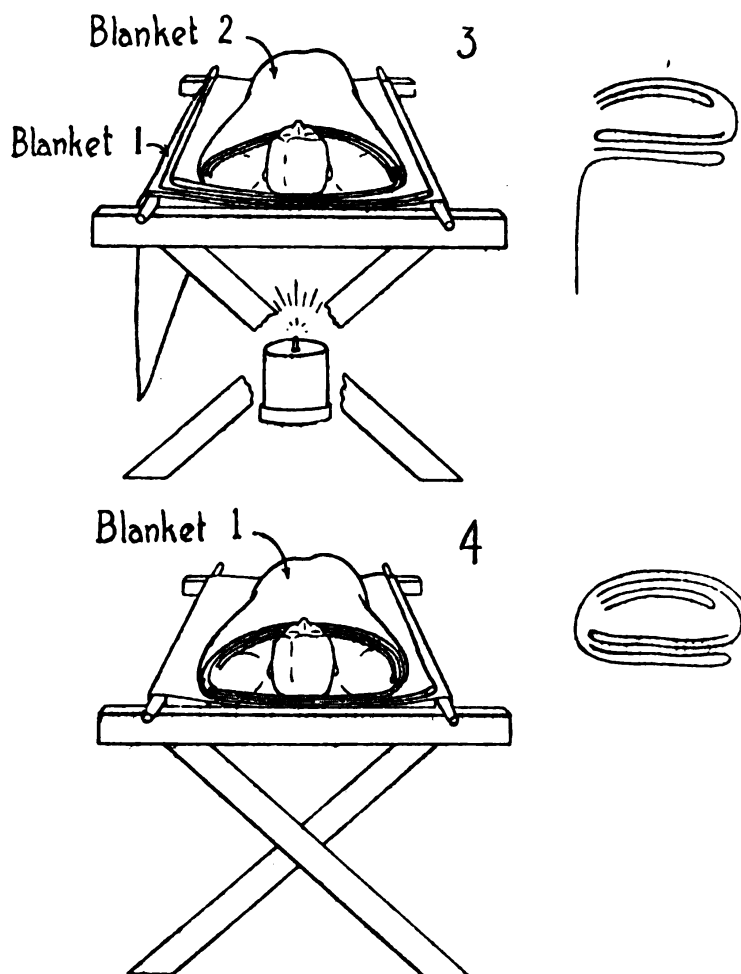


FIG. 31.—Dressed litter for transportation of wounded suffering from shock. Note four layers of blankets over and under patient. (Manual of Splints and Appliances, Am. Red Cross, 1918.)

Location: At or near the “normal drift” of the wounded; avoid “sensitive points.” Depends upon the terrain and available shelter, usually about 300 to 1,200 yards to the rear of the battalion dressing stations.

Functions: Record patients, verify diagnosis tags, morphine and antitetanic injections. Reapply dressings and splints and suture minor wounds when indicated.

Hemorrhage: Tourniquet or other compression. Rarely ligation. Forci pressure.

Shock: Hot alkaline solution internally. Dressed litters (a litter with 3 blankets). Sustain morale. Hot-water bottles or canteens filled with hot water. Improvise shock tables.

Gas: Alkaline solutions internally and externally.

Return malingers and slightly wounded, fit for duty, to front lines.

Evacuation: By litter bearers from the collecting station to the ambulance head.

Ambulance company.—

Personnel: One or more platoons of the ambulance company "at station" with the remaining elements to the rear in support.

Equipment: Each ambulance should be equipped with litters, blankets, splints, etc., to be used for exchange purposes with forward medical elements. Water.

Location: The "ambulance head" may be located forward or to the rear of the collecting station. It marks the farthest point forward from which the ambulances may operate.

Functions: Evacuation of the wounded.

(a) Evacuation from the ambulance head to the advance hospital station.

(b) Evacuation from the advance hospital station to the supporting hospital stations in the rear.

Advance hospital station.—

Personnel: One or more platoons from the hospital company.

Equipment: Sufficient medical and surgical supplies are provided in the Field Supply Table to permit the equipment of this hospital, and the distribution of such equipment is left largely to judgment of the responsible medical officer. As a suggestion items Nos. 1-24 and items Nos. 27-29, inclusive, with six or more tent units complete, with the necessary mess gear, lanterns, buckets, flags, Lyster bags, tools, rolling kitchen, etc.

Location: 1 to 5 or more miles to the rear of the collecting station. **Function:** Record and sort patients. Cleanse and redress wounds. Emergency surgery to save life and to control serious hemorrhage.

Gas: Separate from other patients. Give bath and a change of clothes. Continue alkaline treatment. Pallid and cyanotic type treated as indicated.

Shock: External heat. Intravenous injection. Shock tents. Shock litters.

Hemorrhage: Ligation. Intravenous injection, hypodermoclysis, and proctoclysis, rarely transfusion.

Evacuation: Retain patients for 12 to 72 hours, or until fit for evacuation to the rear, or to duty.

Rear hospital station.—

Personnel: One or more platoons of the hospital company.

Equipment: Sufficient medical and surgical supplies are provided in the Field Supply Table for the equipment of this hospital station.

Location: Probably at the advance base of supplies.

Function: "Definitive treatment" of the sick and wounded. Surgical procedures as indicated.

Hemorrhage: With HB over 25 per cent, use gum arabic in NaCl solution intravenously, with HB less than 25 per cent transfuse.

Fractures: Permanent splints. (See Manual of Splints and Appliances, United States Army.)

Evacuation: By hospital ship, of permanent and semipermanent disabled.

SICK AND WOUNDED ESTIMATES.

Normal sick and injured.—The daily increment of the normal sick and injured requiring hospitalization varies from 1.58 per thousand in peace time to about 5 per thousand in the theater of operations, which when applied to an independent Infantry brigade, United States Marine Corps, of 3,887 men means that the brigade hospital should expect about 6 to 19 new patients per day, depending upon the circumstances.

CONSTANT DAILY NONEFFECTIVE RATE.

Class.	Daily admissions per 1,000.	Daily admissions for a brigade of 3,887 men.	Day when maximum number is reached.	Average days sick.
(a) Sick in quarters, available for light duty.....	3	12	Fourth.....	3
(b) Unfit for duty, remaining with organization (nonavailable).....	3	12	Sixth.....	4
(c) Requiring hospitalization (slight).....	1.5	6	Fifteenth.....	10
(d) Requiring hospitalization (severe).....	1.5	5	Fifty-first.....	32

Total sick after fifty-first day: With organization, 84; in hospital, 252.

NOTE.—The above rates were estimated from figures taken from "Outline of Medical Service of the Theatre of Operations." (Shockley.)

TYPE AND NUMBER OF CASUALTIES WHICH MAY BE EXPECTED FROM
A MARINE CORPS BRIGADE OF 3,887 OFFICERS AND MEN.

CASUALTIES—OFFENSIVE WARFARE.

Table 1.

Open operations.	First day.	Second day.	Third day.
12 per cent killed.....	37	28	19
48 per cent walking wounded.....	150	112	74
40 per cent transportable:			
20 per cent sitting wounded.....	62	46	31
12 per cent lying wounded.....	37	27	18
8 per cent seriously wounded.....	24	20	13
Total casualties for 3 days.....	310	233	155

Table 2.

Trench operations.	First day.	Second day.	Third day.
20 per cent killed.....	62	47	31
40 per cent walking wounded.....	124	93	62
40 per cent transportable:			
20 per cent sitting wounded.....	62	47	31
12 per cent lying wounded.....	37	28	19
8 per cent seriously wounded.....	25	18	12
Total casualties for 3 days.....	310	233	155

CASUALTIES—DEFENSIVE WARFARE.

Table 3.

Open operations.	First day.	Second day.	Third day.
20 per cent killed.....	28	19	9
40 per cent walking wounded.....	112	74	37
40 per cent transportable:			
20 per cent sitting wounded.....	46	31	16
12 per cent lying wounded.....	27	18	9
8 per cent seriously wounded.....	20	13	6
Total casualties for 3 days.....	233	155	77

CASUALTIES—DEFENSIVE WARFARE—continued.

Table 4.

Trench operations.	First day.	Second day.	Third day.
20 per cent killed.....	47	31	15
40 per cent walking wounded.....	93	62	31
40 per cent transportable:			
20 per cent sitting wounded.....	47	31	15
12 per cent lying wounded.....	28	19	10
8 per cent seriously wounded.....	18	12	6
Total casualties for 3 days.....	233	155	77

The above tables were estimated for a brigade of 3,887 men, assuming arbitrary percentages of 8, 6, and 4 per cent loss for offensive warfare on the first, second, and third days, respectively, and 6, 4, and 2 per cent loss for defensive warfare.

These tables give a general idea of the total number and type of casualties to be expected.

ESTIMATE OF THE SITUATION AND FORMATION OF ORDERS.

Introduction.—Before taking up the consideration of the main topics of this discussion perhaps it would be advisable to briefly consider an outline of the development of the medico-military profession. This should serve to give a broader viewpoint of some of the reasons why medical officers should be conversant with the fundamental principles of military art and science.

According to history of early military organization there was little or no attempt to organize a distinct medical department. The chieftain usually assumed the functions of the treatment of the wounded, or else the wounded were deserted upon the battlefield.

Later the Romans developed a separate medical department, employing Greek physicians, upon whom Julius Cæsar conferred the rights of Roman citizenship.

It appears that the medico-military profession of ancient times reached its highest point of development during the reign of Hadrian, 117–138 A. D. A naval medical officer was assigned to each trireme and received double pay on account of the hazardous duty.

The medical officers of the Roman army at this time were permitted to wear the uniform of the Legionaires and were equipped with a surgical kit.

With the decline of the military power of Rome, the prestige of the medico-military profession suffered accordingly, and the separa-

tion of the medico-military profession from the combatant services became more marked.

In the Middle Ages each feudal lord was attended by a private civilian physician, and the surgeons, in addition to their other duties, served as barbers.

In the seventeenth century surgeons of European armies were again permitted to wear a military uniform.

The surgeons of the United States Army were given the right to wear swords in 1839, and in 1847 military rank was secured for these officers.

The recent developments of a more intimate relationship between the Medical Corps and other branches of the military service are a matter of common knowledge.

It will be seen that the medical profession has at some periods been—and at other periods has not been—an integral part in the development of the modern military machine, also that the recent trend is more and more toward the militarization of the medical department.

If the Medical Corps is to maintain the *status quo* of being an indispensable component of a military organization it appears not only of interest, but likewise profitable and necessary, that we devote some time in acquiring a knowledge of the fundamentals of military science—at least to “be able to speak the language of a line officer.”

The numerous demands upon the physician to-day to keep abreast of a rapidly developing profession permits little time and opportunity to delve into other domains. But we should remember, as medical officers of a military organization, that we have a medical specialty all our own (medico-military medicine may be considered as constituting a separate and distinct entity of the medical profession) and that a superficial knowledge of tactics and strategy and allied subjects is perhaps an essential part of military medicine.

To quote a medical officer of the Navy, “We have not yet attained to the comprehensive grasp of the requirements or possibilities of military medicine.”

Estimate of the situation.—The estimate of the situation as now taught in service schools may be defined as a methodical and systematized course of reasoning, adhering to the sequence of a prescribed form, which logical process starts with a clear conception of what is desired to be accomplished—the “mission,” and terminates with a positive and definite recognition of the most suitable plan of action open to us, the “decision.” The information for estimating the situation is obtained from reconnaissance, orders, or other sources.

For the purpose of comparison, the “prescribed forms” as taught in two of the service schools are given below. The variation between

these two forms appears to be due to the fact that one form is adaptable to naval warfare and the other to land warfare—memorize the latter form.

ESTIMATE OF THE SITUATION.

As taught in the Naval War College, Newport.
R. I.

As taught in one of the Army Service schools.

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|---|--|
| 1. Mission. | 1. The mission. |
| 2. Enemy forces; their strength, disposition, and probable intentions. | 2. The enemy. |
| 3. Our own forces; their strength, disposition, and courses of action open to us. | 3. Our own forces. |
| 4. Decision: Major decision (forms paragraph 2 of operation order); minor decisions (forms paragraph 3 of operation order). | 4. Special conditions influencing operations. |
| | 5. Character of the terrain. |
| | 6. Consideration of the different methods by which your mission may be accomplished. |
| | 7. Weather conditions as influencing your decision. |
| | 8. Your decision (forms paragraph 2 of field order). |
| | 9. Plan of action by which you propose to make your decision effective (forms paragraph 3 of field order). |
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A close study of the above outline will show that the estimate of the situation is an analysis, expressed in technical language, of the mental processes which the mind of every individual performs when confronted with special situations or certain problems to be solved.

Undoubtedly an experienced officer will instructively make a correct mental estimate of the situation, without stopping to consider an outline of a standard form of reasoning.

The prescribed outline to be followed is worked out and taught to students for twofold reasons—first, to establish a uniform system of thinking for a superior and his subordinates, and, secondly, to train the inexperienced to follow a definite outline so that it minimizes the possibility of his omitting from consideration any of the essential factors. This tends to prevent an illogical conclusion, due to an incomplete consideration of all influencing factors.

In war there is a constant flow of missions from superiors to subordinates. The decision of the superior is passed to the subordinate in the form of an order and the decision of the superior becomes the mission of the subordinate.

Thus the mission of the Commander in Chief of the Army and Navy may be to “win the war”; one of his decisions may be to “gain control of the seas,” and his decision, as passed along, becomes the mission of the commander in chief of the United States fleet, who

in turn makes a new estimate of the situation, and so on; each decision is placed in an order and is transformed into a mission as the responsibility passes downward.

One of the decisions of the fleet commander may be to capture and establish a naval base at X. The fleet commander places this decision in the form of an order to certain divisions, which order transforms his decision into a mission for certain portions of the fleet.

Some points to be considered by the medical officer in the field when estimating the situation (abstracted from a course of lectures of an Army field service school).—

1. Mission: The mission of a medical department is usually clearly defined.

The collection, evacuation, and hospitalization of the sick and wounded may be our mission.

Consider the question of medical supplies.

Does the element of time change or affect our mission?

What is the mission of our combatant forces?

What is the probable mission of the enemy?

What effect will the success, partial success, or failure of the mission of the combatant troops have on our mission?

2. The enemy: Consider his strength and type of combatant forces.

Would it be possible to employ his supplies and equipment for our own use in case of capture?

What are the probable intentions of the enemy?

How does his position affect our evacuation of casualties?

The training, organization, and morale of the enemy.

3. Our own forces: Strength and composition.

Consider our position as it affects casualties, also the routes of evacuation and sites for medical battle stations.

Consider the supporting troops and plan upon casualties in the reinforcements.

4. Special considerations influencing operations: Tabulate the favorable and the unfavorable factors and compare them.

Note all roads and routes of evacuation; are they protected from the view of the enemy?

5. Character of the terrain: Consider shelter for front-line stations.

Whether to use motor or animal drawn ambulances.

Fordable streams.

6. Consideration of the different methods by which the mission may be accomplished: Consider the relative importance and value of each method.

Which method is best under certain conditions?

7. Weather conditions as influencing your decision: Conditions of the roads.

How will a rain or snow affect our decision?

In case a rain makes a fordable stream impassable for ambulances, what other routes to follow?

8. Decision: The probable number of our own casualties.

The probable number of the enemy casualties which will require medical attention.

Decision as to the probable duration of action.

Number and disposition of the medical units of the command.

Number of medical units to be held in reserve.

The possibility of obtaining other medical units.

Definitely decide the routes of evacuation.

The use of prisoners as litter bearers.

The quantity of medical supplies needed at the front.

The best method of distribution of medical supplies.

9. Plans of action by which you propose to make your decision effective: Allow for a reserve of medical units.

Do not establish battle stations too soon.

Be sure to cover both flanks with medical troops.

Be sure to cover the space between organizations in making out the scheme of the collection of wounded.

Place stations near "normal drift" of the wounded and avoid sensitive points, e. g., points likely to be shelled by the enemy, such as mountain defiles, bridgeheads, roads, junctions, railheads, etc.

Formulation of orders.—The estimate of the situation and the formulation of orders are interdependent.

In the estimate of the situation the student is taught to follow a standard form, which serves as a guide to prevent the omission of any important points.

In the formulation of orders there is likewise a standard form to follow, each paragraph of a field order is supposed to contain a certain type of information or instruction.

"Orders" must not be confused with "commands."

A command is an "injunction to perform a certain act, or to execute an assigned task in a definite way." It allows the recipient little or no latitude of movement to exercise his initiative or to follow his own judgment.

A command is properly used in the place of an order only (a) when the superior in command has valid reasons for not imparting the necessary information in an order to his subordinate, or (b) when the superior officer has some reasons to doubt the professional ability and discretion of his subordinate.

An order is an "injunction to perform a certain task" and permits the recipient to use his own judgment, discretion, and professional skill—to a greater or less extent—regarding the manner of execution of the order.

Consequently field orders contain certain information, in paragraphs 1 and 2, which will enable the subordinate to estimate the situation and work out the details of his plan of action.

The subordinate upon the receipt of this order estimates the situation and then issues corresponding orders to his subordinates.

The following are some types of orders:

The corresponding type of naval order is given, but in order to prevent any confusion it is better to disregard the naval forms and to consider only the land type of warfare in these lectures.

Naval designation.	Army orders.	Description.
Letters of instruction.	Letters of instruction.	Usually comprehensive in scope and for general guidance in situations which will remain unchanged for some time.
Operation orders (strategy).	Field orders.....	Contains plans of action, decisions of higher authorities, and details for combatant and auxiliary forces.
	Administrative orders.....	For administrative details, used only by divisions or higher commands. Smaller units use paragraph 4 of field orders for administrative details.
Battle orders (tactical).		

The following is the construction of a field order. (Vide "Formulation of sanitary orders.")

Heading:

Organization.

Place.

Date.

Hour of issue.

Map of references.

Body:

Paragraph 1, "Information." Contains information about the enemy and our own troops. Paragraph 2, "General plan." Contains "decisions" of the commander and what he purposes to do. Paragraph 3, "Details of the general plan." Contains information relative to the manner in which the commander intends to make his decision effective.

Covers the tactical disposition of troops, and usually contains several subparagraphs, which are lettered serially.

Body—Continued.

Paragraph 4, "Logistics." This paragraph refers to the disposition of trains, noncombatant troops, evacuation, hospitalization of casualties, supply and ammunition dumps, etc.

Paragraph 5, "Communications." Contains information concerning the whereabouts of the commander and how messages may reach him.

Ending:

Signature.

Authentication.

Distribution.

The structure of every combat field order is identical to the above outline. In case there is nothing to insert under one of the headings, the paragraph is numbered and followed by dashes, or else the words "No change" or "No further news" are used.

Field orders to medical units will be issued by:

(a) General staff officers, signing the commanding officer's name by direction.

(b) Medical officer after approval by G-4.

(c) Or direct by the medical officer when authorized to do so.

Information of medical nature is sometimes issued by G-4 as an annex to an administrative order. In this case the responsible surgeon should prepare this matter in the form of a memorandum and submit the same to G-4. Thus a sanitary order may be issued as: Plan of sanitation, Annex No. 2 to administrative order No. 10. In smaller units the sanitary order is issued as a separate field order.

The following order is a plan of evacuation translated into a field order of a medical regiment (a medical regiment, United States Army, corresponds with a medical battalion, United States Marine Corps).

This order is taken from "An Outline of the Medical Service in the Theater of Operations," by Lieut. Col. M. A. Shockley.

As an aid to the study of field orders it would be advisable for the students to use their maps of the area covered by this order, and to plot the disposition of the medical units upon the maps.

See also United States Naval Medical Bulletin, volume 18, No. 1, pages 31 to 39.

PLAN OF EVACUATION TRANSLATED INTO FIELD ORDER OF MEDICAL REGIMENT.

FIELD ORDERS,

1ST MED. REGT.,

No. 30.

Fairfield, Pa., 2 June, '20—12 noon.

Maps: Topographical map, Gettysburg-Antietam, 1:633600. Gettysburg-Antietam, 1:21120, Gettysburg-Knoxlyn, Fairfield sheets.

1. The enemy, consisting of one corps of three divisions, is entrenching on the line Culp's Hill—Cemetery Hill—Round Top. He had no other troops within supporting distance.

Our entire I Corps is now east of the Blue Ridge.

- The 1st Division will attack the enemy position with the I Corps at H hour.

Position components I Corps: Cavalry right and left flanks, 3d Division, reserve, concealed position vicinity Green Mount. 1st and 2d Divisions on the line right to left.

Corps medical regiment crossroads 630. 1st surgical hospital vicinity Fairfield.

1st Division:

Line of departure: Hill 547 (348.6–744.2)—hill 561 (349.0–745.4)—hill 587 (348.3–746.4)—hill 584 (348.6–747.2).

South boundary: Crossroads, NE. of Fairfield—crossroads 604 (339.3–743.6)—Diehls Mill—McGreary S. H. crossroads 540 (350.3–743.3), all inclusive.

North boundary: Crossroads 630 (337.2–748.2), exclusive—crossroads 688 (339.9–744.1), exclusive—crossroads 558 (341.7–747.6), exclusive—J. Smith, inclusive—hill 592 (350.1–746.5), inclusive—Geo. Spangler, inclusive.

West boundary: Corps lateral road, road 616–598–630–679—Orrtanna.

Interior brigade boundary: North boundary, 1st Brigade—crossroads 613–705–659 (342.7–745.7)—Vincent Spur (349.6–754.0)—Diener farm (350.5–744.3), all exclusive.

Dispositions:

1st Brigade, right; 2d Brigade, left; regiments abreast.

1st FA., J. Biesecker; 2d FA., house 600 yards E. of Pitzer S. H.

1st Eng., McGreary S. H.; division reserve, woods N. of Pitzer S. H.

2. This regiment will cover the medical service of the 1st Division in the attack.

3. (a) (1) Sn. Bn. vicinity of house 300 yards SE. of H. E. Boyd's at H minus 5 hours to cover collection of the 1st Division by two

companies active and one in division reserve. Moves with ambulance battalion.

(2) Two collecting stations—one vicinity Willoughby Run, west of J. Biesecker farm, at H minus 4 hours; one vicinity Pitzer S. H. at H minus 4 hours.

(b) Amb. Bn. vicinity of house 300 yards SE. of H. E. Boyd's at H minus 5 hours. Cover collection 1st Division by two companies active and one company division reserve. Route via RJ 613-590-583-705-609-659 between H minus 6½ and H minus 5 hours.

(c) Hosp. Bn. to vicinity crossroads 583 at H minus 4 hours to cover hospitalization 1st Division by two companies active and one company in division reserve. Route: Fairfield—RJ585—RJ590—RJ583 between H minus 4½ and H minus 4 hours.

(d) Veterinary company to vicinity crossroads 731 at H minus 4 hours, to cover collection animal casualties. Moves with ambulance battalion.

4. (a) Service company vicinity crossroads 583 at H minus 4 hours. Moves with hospital battalion. Corps supply park crossroads 630.

(b) Ambulance routes: To 1st Brig., Miedley Crossroads—568—McGreary SH—Trastle—J. Biesecker; to 2d Brig., 705-609-532—Pitzer S. H.

(c) All walkers to advance sorting station Miedley Crossroads (1 mile SW. hill 766).

(d) Routine classification.

(e) Evacuation by corps.

5. Headquarters medical regiment and division surgeon's office, crossroads 583.

Official:

X.

M.

Asst. C. of S. G4. Colonel, Medical Corps, Commanding.

Distribution:

Copies.

C of S.....	1
G1.....	1
G2.....	1
G3.....	1
G4.....	1
Corps Surg.....	1
Reg. hq.....	3
C O Bns., each.....	4
C O Veterinary Co.....	1
C O Service Co.....	1

NOTES AND COMMENTS.

THE CLINICAL APPLICATION OF INSULIN.

In a paper on insulin in the treatment of diabetes which appeared in *Southwestern Medicine* of September, 1923, Dr. Frederick M. Allen included the following remarks on the practical clinical application of this newly discovered remedy in combination with diet:

"The treatment of diabetes began with the restriction of carbohydrate alone by Rollo at the close of the eighteenth century. About the middle of the nineteenth century Bouchardat and others restricted protein as a source of glucose production in the body. Finally, in recent years, it was established that fat and all other sources of energy in the diet increase the strain upon the pancreatic function. The introduction of undernutrition, or limitation of the total calories and body weight in proportion to the severity of the diabetes, resulted in control of a large class of diabetic cases which had never been made symptom-free under former treatment. The early procedure of absolute fasting was long ago abandoned in favor of an extremely low initial diet composed chiefly of protein and carbohydrate. As the weight falls the tolerance rises, and advantage has been taken of this principle to build up gradually the diet which is best suited to the tolerance in each individual case. It has been possible thus to keep the great majority of patients in reasonably good health. Those with the severest grades of diabetes have had to live as emaciated invalids. Nevertheless, even they have been more comfortable than on diets which permit active symptoms, and in my opinion it has been demonstrated that the progressiveness of diabetic cases in general can be actually halted by sufficiently strict care in avoiding functional overstrain. I believe that the recent tendency to a return to high fat diets has represented a distinct step backward. It has never been possible to strengthen or fatten the patients of the worst type with such diets, and the fundamental principle is wrong in that it ignores the slow but powerful influence of fat upon the diabetic tolerance.

"From the foregoing, it is evident that insulin treatment means an attempt to raise the diabetic food tolerance by use of a pancreatic extract. Several corollaries are at once evident. First, the treatment can not be a cure, because an extract can not accomplish the repair of the patient's damaged pancreas. The benefit, therefore, can continue only so long as the treatment is continued. Second,

there is the disadvantage that insulin must be given by subcutaneous injection (or intravenously if specially rapid action is desired). Most hormones obey this rule. Thyroid stands as an exception, and insulin resembles adrenalin and pituitrin in being practically inert when given by mouth or by rectum, because it can not penetrate a mucous membrane, or is too quickly destroyed, or for both reasons. Third, there is another resemblance in the fact that the action of insulin is powerful but brief. Depending on the size of the dose and other factors, the effect is probably maximum in two to four hours and passes off more or less completely within five to ten hours. The doses therefore must be frequent in order to maintain a uniform action. Fourth, there can be no general rule of dosage, but the requirements must be determined by individual study in each case. It is obvious that severe cases must require higher dosage than mild cases, and that high diets must demand higher dosage than low diets. Fifth, the management involves a constant steering between Scylla and Charybdis. If the dosage is too low, the diabetic symptoms will not be controlled; and if it is too high, hypoglycemia may prove serious or possibly fatal. It should be immediately added, however, that with reasonable care all these difficulties can be overcome, and the insulin treatment is both feasible and in the highest degree beneficial.

"As a guiding principle in insulin treatment, just as in treatment by diet alone, we require that glycosuria be kept absent at all times of day and the blood sugar as nearly normal as possible. Some slight degree of hyperglycemia must be permitted in most cases which are severe enough to demand high insulin dosage, because an attempt to maintain a continuously normal level would involve too great danger to hypoglycemia. Some practitioners, including a few specialists, have attempted an easier program by permitting patients to have at least a slight glycosuria every day. The claim is that by this means the danger of hypoglycemia is more easily avoided, and that patients can gain weight, look well, and feel well over long periods in this way. The criticism can be made, however, that this plan accomplishes merely the conversion of a severe into a mild form of diabetes. The marked excess of sugar in the urine and blood is certainly unphysiological, and sooner or later deleterious effects are to be feared from such an abnormality. The injury may conceivably take the form of the well-known impairment of the patient's own tolerance, or particularly, the so-called complications of diabetes are to be dreaded. The incidence of such troubles as cataract, retinitis, carbuncle, and other infections, arteriosclerosis and gangrene has actually been highest in mild neglected cases heretofore, and there seems to be no theoretical reason why these patients receiving inadequate insulin dosage should not be subject to them. Furthermore,

there is abundant proof in the experience of many practitioners that it is feasible and safe to keep any trustworthy diabetic patient symptom-free with insulin treatment, and therefore to permit glycosuria seems to be taking an unjustifiable risk.

"Two extreme plans are possible in beginning treatment. One is to begin with the usual sharp reduction of diet, so as to clear up symptoms with the minimum demand for insulin, and then gradually to increase the diet and dosage to the limits considered best. The opposite plan may be to give a theoretically ideal diet from the outset, and undertake to supply enough insulin for its assimilation. Similar extremes are open in beginning the use of insulin. It may be begun with minimal doses, perhaps of only 1 or 2 units, and increased slowly so that glycosuria is abolished only after a number of days, or large doses may be given abruptly to clear up all sugar within 24 hours, with dependence upon glucose administration to avert any danger of hypoglycemia. Different physicians will doubtless use different methods perhaps with equally good results. It is impossible to hurry beyond a given rate with any plan because the patient's tolerance usually changes with treatment up to a certain point. We ordinarily find institutional treatment of two or three weeks to be desirable in average cases for thorough control together with thorough instruction. In this institute (the Physiatrie Institute, Morristown, N. J.) we generally follow a course intermediate between the two extremes mentioned. If insulin seems to be required at all, we begin with moderate dosage of perhaps 6 to 20 units per day, according to the estimated severity of the case, and increase as indicated by experience. The first diet generally consists of moderate quantities of protein and carbohydrate, perhaps 40 to 60 grams each, while fat is limited to a minimum as a precaution against acidosis and also as a means of aiding the tolerance for carbohydrate and protein. The details of the initial treatment are far less important for success than the planning of the permanent program and the patient's instruction in carrying it out.

"The frequency of injections must also be guided by individual needs. The ideal administration would imitate the action of the normal pancreas, providing a continuous supply of hormone with increases at times of special need. In practice, insulin injections are given before meals, which create the largest demand for the hormone, and dependence is usually placed upon the patient's own pancreas for bridging over the intervals. We find that divided doses increase the effectiveness, and therefore we never give less than two injections per day, i. e., before breakfast and supper. In more severe cases, requiring larger total dosage, three injections, one before each meal, ordinarily suffice. In rare cases with scarcely any

remaining pancreatic function, it has been necessary to give a fourth dose about midnight in order to maintain a fairly uniform curve of blood sugar. The general tendency under the treatment described is toward morning hyperglycemia and evening hypoglycemia; and in the rare cases of extreme severity there are difficulties with either hypoglycemic collapse in the evening or glycosuria in the early morning, unless the extra dose is given during the night. To some extent, irregularities can be balanced by making either the meals or the insulin doses larger or smaller at different times of day. The total diet and total insulin dosage are, however, the chief determining factors. We have found no serious inconveniences with the method described, even among laboring people, and practically without exception the patients or members of their families have accustomed themselves to giving the injections with ease and safety.

"Hypoglycemia, as already mentioned, is recognizable not only by blood analyses but also by characteristic symptoms. In the first stage there may be abnormal hunger, nervousness, or weakness. A sensation of trembling, whether actual tremor is visible or not, is usually experienced. Increasing weakness, mental excitement or confusion, profuse perspiration, and finally loss of consciousness ensue, but convulsions are rare. All thoroughly treated patients become acquainted with these symptoms through their own experience or through witnessing them in others and learn to safeguard themselves either by reducing or omitting the next dose of insulin or by taking the antidote in the form of some easily assimilable carbohydrate. Any sugar will serve; a glass of orange juice or a few pieces of candy are used by some; and we ordinarily advise our patients to carry an ounce package of powdered glucose. If there is inability to swallow or actual unconsciousness an intravenous injection of an ounce or less of glucose usually revives almost instantly and a subcutaneous injection somewhat more slowly. In urgent haste a clean filtered glucose solution may be given intravenously without sterilizing. An intramuscular injection of 1 cc. of 1:1,000 adrenalin solution is used by some as an emergency measure, but we have preferred to have glucose constantly in readiness.

"The basic principles of diet treatment are not altered by insulin. The need for accuracy is, if anything, even greater than before, because the opposing dangers of glycosuria and hypoglycemia can scarcely be avoided except by weighed diets. Only the extreme privations of the past are avoided. We aim to give every child enough food to grow and develop normally, and every adult enough food to carry on his regular labor while remaining at least 5 or 10 pounds below the standard normal weight for his height. The patients who can attain these ideals without insulin are the ones who do not need insulin."

VACCINES AND THE X RAY IN THE TREATMENT OF WHOOPING COUGH.

An extensive epidemic of whooping cough which occurred in Worcester, Mass., in February, 1919, afforded Dr. William W. McKibben, of that city, an excellent opportunity to test out the value of vaccines in the treatment of that disease. The results of his observations are recorded in an excellent paper which appeared in the Boston Medical and Surgical Journal of September 6, 1923.

Many writers, as the result of effects obtained in whooping-cough clinics, asylums, and private practice, are convinced that the routine administration of pertussis vaccine is of value for both curative and prophylactic purposes. E. J. Huenckens (Amer. Jour. Dis. Children, Oct., 1917) treated a number of healthy children with pertussis vaccine to study its effect on antibody formation, which he determined by means of the complement-fixation test. He concluded that it was possible to immunize children against pertussis if sufficiently large doses of freshly prepared vaccines are used.

The vaccines at first used were plain vaccines prepared from the Bordet-Gengou bacillus. As time brought more experience, mixed vaccines were used. The combined vaccines containing *B. pertussis* and *influenzae*, *streptococci*, *pneumococci*, *staphylococci* (*aureus* and *albus*), and *micrococci catarrhalis* were found useful in those cases with complications, those of long duration or the small number of cases which resisted the plain vaccine.

Serologic tests have been conducted by Luigi Auricchio, of Rome (Policlinico, Jan., 1923), with a view to determining experimentally the immunizing properties of the patient's serum after vaccination. Search for specific antibodies was made before, during, and after vaccination, both by complement-fixation tests and agglutination reactions. These investigations showed that vaccinations were uniformly followed by the formation of specific antibodies and elevation of the opsonic index. The agglutinating properties of the peripheral blood serum became noticeable, on the average, 6 to 8 days following the first vaccine injection, reached their maximum 10 to 20 days following the last injection, and remained at this level for about a month, after which they began to diminish. The limits of agglutination reached were not very wide; for the most part they were from 1:50 to 1:100.

Much more sensitive, although appearing relatively later, were the complement-fixation tests. There was obtained uniformly a gradual inhibition of hemolysis, at first barely noticeable, between the tenth and fifteenth days following the first vaccine administration, but reaching its maximum intensity soon thereafter and maintaining itself at such point during the entire duration of the experiment. Opsonic index observations showed in each instance early and

marked increase in phagocytic properties, reaching its maximum between the tenth and twentieth days following the first injection.

For prophylactic treatment Auricchio used a fresh vaccine prepared every 10 or 12 days from four different strains of Bordet-Gengou bacilli, 20 billion per c. c. Children under 5 years received three prophylactic intramuscular injections on alternate days, 4 billion in the first and 6 billion in the second and third injections; 38 children out of 40 exposed to the disease escaped.

The vaccine used by Doctor McKibben contained 4 billion bacilli representing the four strains of the Bordet-Gengou organism, or 5 billion of the mixed bacteria to each c. c. Injections were made deeply into the gluteus maximus muscle and caused little or no reaction except in the case of the mixed vaccine.

For prophylaxis he treats infants the first day with one-half billion, the third day with 1 billion, and the fifth day with 2 billion. Children require twice this dosage. Immunization is not established until from 10 days to 3 weeks.

McKibben points out that the contradictory results reported by various observers have been due principally to three reasons: First, there are apparently four different strains of the Bordet-Gengou bacillus which, if possible, should be included in every vaccine; secondly, that small doses have been used because of an unwarranted fear of a reaction; and, third, the vaccine was not freshly made.

The initial therapeutic dose used by McKibben for children was 1 billion, in two days 2 billion were given, and in another two days 4 billion. The fourth and often the last dose was 5 or 6 billion, repeated once or twice at two or three day intervals, if necessary. Infants, except very weak ones, were given just half the above dose. As experience showed no injurious effects from large doses, the fifth and sixth dose, if it were necessary, reached even 8 or 10 billion in older children.

The therapeutic use of fresh vaccines in this manner promises three things: First, that the number and severity of the paroxysms ordinarily steadily decrease after the third or fourth injection; second, that the ultimate duration of the disease is reduced from two or three months to three or four weeks, with a lessening of the severity of the symptoms; third, that the chances of dangerous complications are diminished. These results are due to the vaccine alone, as it was not administered in conjunction with any other remedy, such as the favorite antipyrine mixture.

Henry I. Bowditch and Ralph D. Leonard (Boston Med. and Surg. Jour., March 8, 1923) make a preliminary report of 26 cases treated by the X ray; the patients, from 3 months to 43 years, were in all stages of active pertussis (1-10 weeks). Each patient received three or four applications of the rays at two or three day intervals.

the dosage according to age, but well under an erythema dose. Many of the patients had not been observed sufficiently long for final result, but definite improvement resulted, which can not be accounted for by mere accident. No rational explanation of action was offered. A small percentage could be classed as prompt cures, as the spasms and whoops entirely disappeared after two or three applications. The majority of the patients, perhaps 70 per cent, were relieved; 10-15 per cent were apparently not relieved. The authors believe that the X rays may be of more value than any other form of therapy, including serum, but further careful scientific study of such cases is needed.

In a discussion of Doctor McKibben's paper, at a meeting of the Massachusetts Medical Society, Dr. Henry I. Bowditch, of Boston, said:

"The Boston Floating Hospital staff have had a chance to put to a real test the X-ray treatment of that disease. They now naturally wish to speak a little, but will later go further into deeper reports.

"We had approximately 850 cases, from four weeks on. We treated with the X ray at intervals. The first exposure (the first day that the patient appeared) was given after physical examination, and an X-ray plate was taken for future work. The second treatment was given on the third day, or 48 hours after the first treatment; the third treatment on the fifth day, still 48 hours after the second treatment. If no further treatment was necessary, or desired, our treatment stopped. When more treatment was desired we allowed seven days to go; that is, 12 days from the beginning, and then followed it up with the fifth or last exposure on the fourteenth day.

"Exposure was taken as follows: We changed each time from anterior to posterior aspect of the chest, clothes on, so that there was no thermal danger, and the ray tube was 26 inches away. We used filter A and then gave 12 to 16 milliamperes from three to four minutes. Shorter treatments were given for children under eight months.

"Our results in the majority of cases were as follows: Eight hours following exposure the cough became softer and less frequent, vomiting stopped, convulsions ceased, and the children slept. Sixteen hours later the cough returned, became more or less characteristic, while vomiting and convulsions did not reappear. Subsequent treatment had more or less the same effect.

"These remarks are general.

"One or two months after treatment the mothers gave the X-ray exposure the mark of 75 per cent to 100 per cent. There were some who found no relief. There was no absolute cure.

"In a word, this treatment should be used further. We seem to feel that associated with the vaccine we have two of the best arms of therapy."

THE CAUSES OF HEADACHE.

Headache may be associated with almost any form of illness; it may be so trivial and so persistent as in time to be regarded almost as normal; it may be so severe as to make life intolerable. There is hardly a symptom encountered in the practice of medicine so common and at the same time so little understood. It presents no outward and visible signs. Our knowledge of its character must depend almost entirely on the patient's statements, and in a large number of cases we can only conjecture what is the actual process which causes the pain. But without some such conjecture, without some sort of mental picture of the origin of the symptom, its treatment can be little more than empirical.

In an article on the causes of headache which appeared in the *Lancet* of September 8, 1923, Dr. A. B. Pavay-Smith points out that every headache falls into one of three main groups, and he offers the following classification as useful in attaining an understanding of the symptom.

1. INTRACRANIAL.

A. Cortical.—*Headache arising in the sensory cortex.*

- (1) Functional—e. g., hysteria; neurasthenia; migraine (hemikrania).
- (2) Organic.—Disseminated sclerosis.

B. Dural.—*Headache due to irritation of nerves of dura mater.*

(1) Intracranial pressure—

(a) Raised by—

(i) Hyperemia—

- (a) Active—e. g., head injury; fevers; nephritis; bacterial toxemias; fatigue; reaction after syncope; meningitis; constipation; menstrual and uterine poisons (lead, alcohol, etc.); anemia.

(b) Passive—e. g., asphyxia; morbus cordis.

(ii) Cerebral edema.—Head injury; sunstroke.

(iii) Increase of cerebrospinal fluid.—Hydrocephalus; meningitis; head injury.

(iv) Increase of cranial contents.—Tumor; cyst; gumma; abscess; extravasated blood.

(b) Lowered by deficiency of cerebrospinal fluid; *headache due to pressure of unsupported brain on basal dura and tentorium.*

(i) Leakage.—Lumbar puncture.

(ii) Hyposecretion.—Anemia.

(2) Inflammation.—Pachymeningitis—localized suppurative meningitis; subdural abscess; general paralysis insane.

2. CRANIAL.

A. Bone disease.—*Headache due to irritation of periosteal or dural nerves.*

Osteitis.

Periostitis.

Extradural abscess.

e. g., infected fractures; extensions of otitis media; syphilitic necrosis.

B. Nasal sinuses.—*Headache due to irritation of nerves in mucosa lining.*

Sinusitis and retention.—Headache without other symptoms or with nasal catarrh or obstruction.

"Excitable" sinus.—Constipation; toxemias, menstrual.

N. B.—Pain arising in the middle ear and mastoid is not included under "headache."

3. EXTRACRANIAL.

Headache due to irritation of nerves or nerve endings outside the cranial wall and referred.

(1) *Ocular.*—Muscular fatigue—errors of refraction.

Hypertension—glaucoma.

Inflammatory—iritis.

(2) *Dental.*—Fronto-nasal headache referred upon upper incisors—dental caries.

(3) *Nasal.*—Pressure on septum—headache with nasal obstruction.

Meckel's ganglion inflammation—"sphenopalatine syndrome."

(4) *Neuralgic.*—Irritation of branches of fifth or other scalp nerves—trigeminal neuralgia; cervical caries (occipital).

(5) *"Rheumatic."*—Inflammation of muscle or aponeurosis of occipito-frontalis—myositis; "muscular rheumatism."

The majority of headaches are probably due to irritation of the nerves of the dura mater. Concerning this subdivision in the classification, Doctor Pavey-Smith says:

"The cortex and cerebral tissues themselves have frequently been demonstrated to be quite insensitive; the inner lining of the skull, on the other hand, is well supplied by branches of the trigeminal and other cranial nerves, and in certain areas pacinian corpuscles are present. Moreover, the dura is homologous to periosteum, which is known to be pain sensitive. The headache originates in the dura, the nerve endings of which are irritated by pressure or inflammation. Anything which raises the intracranial pressure may thus produce a headache: (1) Cerebral hyperemia and cerebral edema account for such headache as accompanies acute fevers, asphyxia, renal disease, toxemias whether bacterial or otherwise, and many head injuries; (2) increase of cerebrospinal fluid; (3) mass increase of cranial contents, by tumor, abscess, gumma, extravasated blood, etc. Any of these may produce pain by pressure on the dura in the absence of any inflammatory irritation of it. In a similar way, headache may result from inflammation of the dura acting alone, whether localized or general, acute or chronic. But the dural nerves appear to be far more susceptible to pressure than to inflammation.

The intense headache of cerebrospinal fever is immediately relieved by lumbar puncture, though in many cases the dura remains all the time in an acutely inflamed state. Headache of this type may arise in other conditions where these two factors, pressure and inflammation, are combined—whenever, in fact, pachymeningitis carries with it a high intracranial pressure. The importance of raised intracranial pressure as a cause of headache has been proved frequently. The severe headache of pituitary tumor is relieved by decompression, that of meningitis by lumbar puncture. Reports on head injuries during the war showed headache to be more severe in, and more particularly associated with, those cases in which the skull was intact, while cases of much more extensive trauma, with exposure of the cranial contents, were relatively free from headache.

“Little is known about the regulation of intracranial pressure as regards either blood supply or production and absorption of cerebrospinal fluid. It is reasonable to suppose that headache associated with a high systemic blood pressure, such as that of chronic nephritis, may be relieved as a result of lowering the blood pressure. At the same time it is quite as possible that the cerebral congestion is due to the action of toxins of intestinal or other origin, and that depletion cures the headache by removal of the toxin. Headaches of this type—high-pressure headaches, in which there is no intracranial inflammation—tend to be dull, and are increased on lying down; they are relieved by anything which lowers the pressure; if intermittent they do not tend to recur constantly in the same place; they are not accurately localized.

“It is possible that in the great majority of cases in which headache occurs as one of several symptoms, as part of a recognized syndrome, or as one feature great or small in some general condition, the headache is of this type; that is to say, it is due to irritation of the dural nerve endings from increase of intracranial pressure, general or partial, transient or progressive. The headache which occasionally follows lumbar puncture appears after this a paradox, but, unlike most forms, it is relieved by lying down and made worse on sitting up. It is almost certainly due to pressure of the brain on the tentorium and basal dura owing to lack of the supporting fluid cushion. One form of headache met with in anemia resembles this; it is possibly due to a diminished secretion of cerebrospinal fluid.

“It will be obvious in the light of clinical experience that the pressure explanation of headache is inadequate. There are unknown factors which determine the relation between the severity of the headache and the degree and direction of the pressure. Time is one of these factors. An increase of cranial contents arising slowly, as in cerebral tumor, may reach a higher level before headache is

produced, as the tissues have time to adapt themselves. In the case of the rapid increase from active or passive congestion headache is likely to arise sooner, the inelastic walls of the cerebrospinal system having had no time to stretch. It is also probable that some areas of dura are more sensitive to pressure than others."

The nasal sinuses are a prolific source of headache. "Headache arising from a nasal sinus is due in almost all cases," says the writer, "to inflammation of the lining and pressure. The latter is, again, as in 'intracranial' headache, the important factor. It is retention of secretion which causes the pain. For this reason the headache bears no direct relation to the severity of the infection or inflammatory process. A mild catarrhal sinusitis producing clear mucus may cause a severe headache, while a profusely suppurating sinusitis with destruction of the mucous lining may be painless. The determining factor is the efficiency of the outlet. This applies to *chronic* sinusitis; it is probable that no acute sinusitis is painless.

"The openings of the nasal sinuses are small. This fact accounts for the relative infrequency with which infections of the nose reach the sinuses, but at the same time it has the result that a small amount of swelling is sufficient to close the opening and cause retention. Several of these ostia, again, are situated in a part of the nose so narrow that a very slight degree of deformity will prevent efficient ventilation and favor an inflammatory process around the opening, which is already at a disadvantage. This is particularly the case with the frontal sinus, of which the narrow tubular opening lies under cover of the middle turbinate. If the latter is swollen, hypertrophied, or pressed outward by a deviated septum, the opening may become closed. Such a closure may cause headache without any true infective sinusitis. The air in the sinus becomes absorbed and a partial vacuum results. This gives rise to congestion of the lining, with frontal headache and tenderness; the condition has been described by Sluder as "vacuum frontal headache." A headache of this type is supraorbital, usually unilateral, worse in the morning, and increased by close work with the eyes; the last symptom is due to the pull of the superior oblique muscle on the trochlea which is attached to the thinnest part of the floor of the tender sinus. The ethmoid and sphenoid sinuses communicate with the nasal cavities through comparatively simple though small orifices and not by a tubular or grooved opening like that of the frontal sinus. This simpler type of opening, from its smallness, can easily become blocked by inflammatory swelling of its edges, but is not affected by lateral pressure, such as results from nasal deformities, and causes closure of the frontal sinus. The latter is susceptible to both forms of attack,

and this is one of the important factors which make a frontal headache the commonest clinical variety.

"Nasal sinus headache has certain characteristics. It is frequently the only symptom, the patient being otherwise in good health. In acute sinusitis it may be neuralgic in character or intense and throbbing. In more chronic cases it may take any form, including that of a sense of uncomfortable pressure from without. It tends to be localized to one area, and, if recurrent, the same area is affected each time. Anything which increases the congestion of the lining immediately increases the headache. Thus the patient may have discovered by experience that stooping to pick anything up is accompanied by the most acute pain. The same applies to coughing, and, to a certain extent, to jarring movements. Periodicity is a very marked feature. The pain is usually worse in the morning. In connection with this fact it must be remembered that the frontal and sphenoidal sinuses drain by gravity in the erect position only, and consequently tend to fill up during the night. This morning pain is so definite and punctual a feature that it has been called 'sun pain' from a mistaken idea that the heat of the sun was the cause; cases have actually been diagnosed as malaria from the regular recurrence of the headache. There is a general tendency for the pain to come on suddenly, to reach its maximum rapidly, and, after a variable period, to vanish with equal suddenness.

"As regards position, a sinus headache is usually unilateral—the opposite to 'intracranial' headache. In the case of the frontal sinus it is referred to the supraorbital region, and is associated with local tenderness, especially of the floor under the inner third of the supra-orbital margin. With the deeper sinuses, ethmoidal and sphenoidal, localization is by no means so definite. Sphenoidal pain is referred to the temporal regions, the occiput, or the vertex. In the last position the 'heavy-weight' sensation is not uncommon; a fact which must be remembered before a diagnosis of *clonus hystericus* is made. Pain arising in the ethmoid may be referred to the back of the eye or the region of the inner canthus. Some of these features occur, of course, in headaches of intracranial origin. They are not in themselves definite evidence of sinus mischief, nor are they by any means essential to a case of sinusitis.

"The following points in a case of headache should arise a suspicion of the pain being due to sinusitis: (1) If the headache is unilateral, and especially frontal; if it shows a marked periodicity; is worse in the morning; has a sudden onset; always recurs in the same place; and is immediately greatly increased on stooping, then a sinus should be suspected. (2) If, in addition, there is a history of 'catarrh'; if the nasal airway is defective on either side (and patients may be quite unaware of this); and if the patient is other-

wise in good health, sinusitis is still more likely. (3) Finally, if the headache is relieved by inhalations of steam, medicated or not, it can be definitely concluded that its source is in the nose."

DETERMINATION OF CARBON MONOXIDE IN THE BLOOD.

The Bureau of Mines, Department of the Interior, has recently issued a pamphlet (serial 2486) in which the pyrotannic-acid method for the quantitative determination of carbon monoxide in the blood and air is described. A diagnosis of carbon monoxide poisoning is usually made from the history and the symptoms and is readily determined in frank cases. Carbon monoxide, however, is often present in unsuspected places in amounts sufficient to produce chronic poisoning. Cases of subacute poisoning—those in which the patient is exposed to a concentration sufficient to cause only headaches, malaise, and dizziness—may be incorrectly diagnosed, and, hence, improperly treated, as the symptoms of this type of poisoning are common to other causes. The best method of diagnosis in this type of case is by examination of the subject's blood. Many methods for the detection of carbon monoxide in the blood have been developed, but owing to various disadvantageous factors have never come into common use. By use of the method developed by the Bureau of Mines, it is possible to detect the presence of carbon monoxide in the blood in 3 minutes and to determine the exact amount present within 15 minutes.

This fact is of interest in connection with the subject of "heat prostration" which occasionally affects the personnel of the firerooms of cruising vessels. The cause of heat prostration is not clear. For many years we have been satisfied with the theory that heat and humidity are the causative factors, but they do not explain cases of heat prostration which occur soon after men go on duty in the fireroom when they have been exposed to a moderate temperature for a short time only and before they have made any severe exertion. It is quite possible in these cases that carbon monoxide poisoning may be a factor as intimated by Capt. D. N. Carpenter, M. C., United States Navy, in a paper on "Smoke and powder gases in naval warfare," which appeared in the *Military Surgeon* of November, 1916.

When investigating the contamination of air from powder gases on the U. S. S. *Kansas*, Doctor Carpenter considered the possibility of coal gas contamination through furnace doors, open for stoking. Under forced draft an air pressure of $1\frac{1}{2}$ inches of water is carried in the firerooms, but in spite of the steady blast of air through the firerooms there will always be a certain amount of diffusion of furnace gases. With the automatic firing device set at 15

seconds and with eight fires to a fireroom being stoked on the *Kansas*, two doors were open all the time and from these coal gas constantly escaped. Utilizing a canary bird, having a susceptibility to 0.05 per cent of carbon monoxide, as a delicate test for the presence of carbon monoxide during a full-power run on the *Kansas*, Doctor Carpenter found that the bird showed symptoms of distress within a few minutes after entering the fireroom. The temperature and ventilation of the fireroom were unusually good, yet the air contained carbon dioxide—7.2 parts in 10,000, nearly twice as much as the amount found in the air of the forecastle.

Constant exposure to small amounts of carbon monoxide will result in chronic poisoning shown by pallor and may be one explanation of the pallor of the engineer division, which is usually attributed to the lack of sunlight and fresh air. Acute poisoning by carbon monoxide is preceded by intense headache and a feeling of suffocation (choke damp), then the patient becomes unconscious. Two cases of heat prostration on the *Kansas* had just these symptoms. They had been in the fireroom only a short time.

In Doctor Carpenter's report we have sufficient evidence to warrant further study by medical officers of this suggested cause of heat exhaustion, and this study will be greatly facilitated by the use of the pyrotannic-acid method for the quantitative determination of carbon monoxide in the blood. This method is based on the fact that a light brownish gray suspension is formed after a few minutes when normal blood diluted with water is treated with a solution of tannic and pyrogallic acids. Light carmine suspension is formed in blood having CO in combination with all of the hemoglobin (Hb), furthermore in any mixture of the two extremes of color. Thus, by making a set of standards to represent the different colors of varying but known amounts of CO in combination with Hb, unknown specimens can be matched to them, and the amount of carbon monoxide-hemoglobin (CO Hb) evaluated.

FUNGI OF FROZEN MEAT.

We learn from the British Medical Journal of September 8, 1923, that "the Department of Scientific and Industrial Research of the Food Investigation Board has just issued a report, by F. T. Brooks and C. G. Hansford, on mold growths upon cold-storage meat. The more detailed and technical part of their report has already appeared in the Transactions of the British Mycological Society, but the first six pages give a clear and useful account, in plain language, of the kind of mold that grows under conditions of cold storage. Putrefactive bacteria, whose growth is inhibited by low tempera-

tures, causes meat to go bad, but the molds that grow at temperatures about or below freezing point are harmless, although they give the meat a disagreeable appearance. The best known, the most unsightly, and the most serious from the economic standpoint is the *Cladosporium herbarum*, which causes what is known on cold-storage meat as 'black spot.' It will grow at a temperature of 18° F. Other characteristic molds are the white and the bluish-green molds. The former are of two varieties—one the *Sporotrichum carnis*, which has not hitherto been described scientifically, causing small white spots, and the other the molds which give rise to the profuse growths known in the meat trade as 'whiskers.' These growths project for more than an inch beyond the surface of the meat but collapse when exposed to a relatively dry atmosphere. The bluish-green molds belong to the well-known genus *Penicillium*, commonly found in cheese and on rotten apples and oranges. Another form of growth, that almost invariably arises on meat exposed to a temperature a degree or two above freezing point, consists of small colonies of certain yeasts, either pink or white in color. When dry the white colonies frequently assume a brown color, the 'brown spot' referred to by other workers on meat molds. These colonies of white yeast are difficult to distinguish from groups of bacteria, although in view of their relative significance in condemning meat or otherwise it is important to do so. The practical lessons which are learned from the report are the necessity of cleanliness in abattoirs, and of cooling the meat as rapidly as possible after slaughtering so as to avoid mold spores settling on it before it is placed in cold-storage chambers of 10° to 15° F. Where storage chambers get badly contaminated with mold spores the meat should be removed and the chamber thoroughly cleansed with disinfectants before fresh meat is placed in it. But it is comforting to know that the mold growths are innocuous and can be removed easily from the surface of the meat or can be cut away when they grow into the skin, as in the case of 'black spot.' "

RAT EXTERMINATION.

The destruction of rats on board ship frequently becomes a perplexing problem to medical officers. The following data on rat poison have been furnished by the United States Public Health Service, and are reprinted from the Illinois Medical Journal of September, 1923:

"The most efficient rat poison is barium carbonate, which is one of the few which a rat fails to detect. It is safe to handle, and in amounts necessary for use it is not dangerous to man. It has been

found that 15 grains are necessary to kill a cat, 20 grains to kill a chicken, and that dogs withstand a dose of 140 grains, while 3 grains are sufficient to destroy any rat.

"Three or more kinds of bait should be used. Each must be mixed separately with barium carbonate. One kind of bait from each of the following classes should be used: Meat or other animal substance, such as hamburg steak, sausage, canned salmon, eggs, or oysters; fresh fruit or vegetable food, such as cantaloupe, tomatoes, green corn, baked sweet potatoes, bananas, etc.; miscellaneous foods, milk or cheese, peanut butter, bread, cake, cereals (raw or cooked).

"The barium carbonate must be thoroughly mixed with the bait, so that the rats can not eat the smallest portion of the bait without getting some of the barium carbonate. In the case of such substances as hamburg steak, cheese, etc., use one part of barium carbonate to four parts of bait. Mix thoroughly with a spoon. Substances which can not be thoroughly mixed with the barium carbonate as just described (for example, cantaloupe, tomatoes, etc.) should be cut into small pieces and thoroughly covered with the barium carbonate and then worked in with a knife.

"The three kinds of bait, prepared as above, should be divided into small portions, about a teaspoonful each, and placed freely about premises, alternating the different baits in the order named. It should be set at short distances, not over 10 or 15 feet. Do not mix the different kinds of bait with each other.

"The morning after baiting look for dead rats and remove them. Take up baits. Examine these so as to see which have attracted most rats. If any kind of bait has not been touched, use a different bait instead of this. Fresh bait should be used each night.

"Bait should be made fresh each day, or at most every second day: a hard, stale bait is rarely eaten by a rat. The bait should be distributed in such parts of the building as are frequented by rats, and this is best done in the evening. A record should be kept of the number of baits so distributed and the number eaten by rats. During poisoning operations special efforts should be made to keep all food usually available protected from their access."

THE USE OF OPHTHALMOSCOPE.

The following editorial on the use of the ophthalmoscope which appeared in the Rhode Island Medical Journal of September, 1923, recalls to mind the history of this useful instrument which, as the writer indicates, is not employed as frequently as it might be:

"When the great physicist von Helmholtz invented the ophthalmoscope, he placed in the hands of the physician an instrument which

was to prove no less valuable than the stethoscope of Laennec; for as the latter amplified both the range and the precision of the ear, so the former in a very literal sense made the darkness visible. From a craft of mere empiricism and sagacity, confined for the most part to superficial observations, ophthalmology became, after the introduction of the ophthalmoscope, a study of deeper affinities pursued in a truly scientific spirit. One can well appreciate the feeling of exaltation with which Albrecht von Graefe saw, for the first time in his notable career, the retina of a living patient. And what emotions must have stirred within him when in 1859 he first made the brilliant diagnosis of embolism of the retinal artery as being the pathological condition in a case of sudden blindness, and then went on to dispel contemporary ignorance by showing that most cases of blindness and impaired vision associated with cerebral disorders were owing to optic neuritis rather than to paralysis of the optic nerve, as had been the common belief before his time! In Holland that gifted polylinguist Donders, while waiting for one of Helmholtz's ophthalmoscopes, turned his impatience to good use by contriving one for himself in which a silvered mirror with central perforation was substituted for the superimposed glass plates of the Berlin master. A little later, in Leeds, the youthful Dr. Clifford Allbutt, then as now facile princeps in clinical medicine, was busy with the ophthalmoscope and was collecting the material for his handbook of ophthalmology published in 1871. Hughlings Jackson was at work in London with Jonathan Hutchinson as associate and William Gowers as disciple, doing, all of them, pioneer work of the first quality. Hughlings Jackson used to remark that he considered it the most fortunate thing in his whole medical career to have begun the studies of his profession in an eye hospital; and he never wearied of inculcating in the minds of his younger colleagues the important services which ophthalmology can render to general medicine. In America, Weir Mitchell and many others who witnessed the birth of the ophthalmoscope paid their tribute of praise to the great services it was rendering the physician. In our own day, to praise the ophthalmoscope were to indulge in the painting of lilies.

"And yet we can all bear witness to the curious paradox that whereas every physician uses his stethoscope daily and would feel lost without it, few physicians own and employ the ophthalmoscope. But, if one stops seriously to reflect upon it, what a great pity this is, for where, except in the eye, can one view directly a nerve, an artery, a vein, and a nerve expansion? Inside the eye—a veritable microcosm contained within the macrocosm of the body—Nature presents for us, if only we will but look and see, the fair picture of health and the tragic delineations of disease. The fury of local storms we may study as well as the wreckage borne in upon the tides

of more general disturbances, for the eye has perhaps more pathological sympathy than any other organ of the body. If you would know whether a persistent headache is meningeal, perhaps syphilitic in origin, examine the choroid for evidence of past or present inflammation, because the pia mater is the choroid of the brain. If some obscure cerebral disturbance is caused by a tumor, the ophthalmoscope may disclose an optic neuritis and decide the issue as between functional and organic mischief. Looking through this small window of a pupil one can see the local tissue changes which are part of more widely scattered degradations elsewhere throughout the body; thus do diabetes and nephritis and lead give evidence of their presence. The arteries too are here visible in their health as well as in their decay, giving timely warning of approaching, but possibly preventable, disaster. When Wassermanns are negative and symptoms perplexing, the presence of optic therapy may clarify for us the real significance of certain "rheumatic" pains in the arms or legs. And so we might go on enumerating many more of the helps which the ophthalmoscope is prodigal in giving to general medicine. Nothing we have said is news to any physician, and yet there is a very notable neglect of ophthalmoscopy. It is strange, to say the least of it, that we who are so anxious for exact knowledge based upon the data of observation should cultivate our senses of touch and hearing by the use of percussion, palpation, and auscultation, while we neglect, or almost neglect, to extend and refine our knowledge by the ophthalmoscopic use of our eyes."

VENEREAL DISEASE IN DENMARK.

Medical officers, who have devoted time and energy to the reduction of the incidence of venereal disease in the Navy, may be gratified to learn that progress in this direction is reported from Denmark.

We learn from the *Lancet* of September 1, 1923, that in connection with the centenary celebrations of Pasteur's birthday, Prof. C. Rasch, of Copenhagen, was invited to contribute a paper on the subject of venereal disease and the campaign against it in Denmark. His small brochure, with the title "*La lutte antivénérienne en Danemark*," gives not only a very comprehensive review of what has been done in Denmark in the past, but it also shows what a remarkable effect modern methods of treatment have had on the incidence of syphilis in the years 1921 and 1922. With regard to the past, Denmark has certainly been a pioneer in many directions. So soon as 1672 the treatment of venereal disease by quacks was forbidden. In 1788 free hospital treatment for all cases of venereal disease was

provided. As early as 1859 penalties were attached to the propagation of this disease, and 10 years later its study was made compulsory for medical students. In 1874 compulsory treatment for all cases of venereal disease was introduced, and in 1900 Credé's method of dropping silver nitrate into the eyes of the newborn was made obligatory. In all these matters Denmark led the way, and in 1906 various other provisions were made for the comprehensive control of venereal disease. When Professor Rasch was invited to give a survey of the results, up to date, of the venereal disease campaign, he, in cooperation with Dr. Svend Lomholt, addressed questionnaires to 130 heads of hospitals and similar institutions, and obtained information of great statistical value. It appears that the hospital accommodation in Denmark is greater than that of any other civilized country, and apart from sanatorium and asylum beds, Denmark, with a population of only 3,300,000, has about 14,300 beds, many of which are at the disposal of the subjects of venereal disease. But it seems to be rather ambulatory treatment with salvarsan and other specifics than hospital treatment that has brought the incidence of syphilis down with a run. In 1921 there were 1,942 new cases of syphilis in the whole of Denmark, as compared with 1,578 in 1922. The number of new cases of congenital syphilis in these two years was 142 and 95, respectively. In 1912 Doctor Lomholt investigated the number of recent cases of syphilis in Copenhagen, and he came to the conclusion that in this year there were about 1,300 such cases. A comparison of these findings with those of 1922 led him to the conclusion that the incidence of syphilis had declined in this period by about 33 per cent. The evidence of these figures is supported by the impressions of most specialists with whom Doctor Lomholt has conferred, and it is noteworthy that the incidence of gonorrhœa has also shown a marked decline in the period 1910-1922. In the 5-year period 1900-1904, there were 16 cases of blindness due to gonorrhœa, and in the 10-year period, 1905-1914, there were only four such cases. Yet in other continental countries about 20 per cent of all cases of blindness are still due to gonorrhœa.

PATHOLOGICAL CHANGES IN EPILEPSY.

In an article on "The space-compensating function of the cerebrospinal fluid—Its connection with cerebral lesions in epilepsy," appearing in the Johns Hopkins Hospital Bulletin of August, 1923, Dr. Walter E. Dandy discusses the significance of certain pathological changes which are found quite regularly on operation for the relief of epilepsy. These changes are: (1) Dilatation of the ventricles, (2) collections of fluid on the surface of the brain, (3) pockets

of fluid in the brain substance, (4) softening of the brain in association with these collections of fluid, (5) areas of induration in the brain (fibrosis or gliosis), (6) changes in the meninges, and (7) congenital malformations. He believes that these are evidences of actual cerebral lesions (end products of repair), and the frequency of the findings leads him to the conclusion that there is a pathological basis for so-called idiopathic epilepsy in a large proportion of the cases. He obtained confirmation of this view by means of ventriculography, which in a certain proportion of cases shows acquired or congenital distortion of the ventricles.

Nearly all intracranial lesions in greater or less degree require or produce changes in space, either transiently or permanently, and these space alterations must be met by intracranial contents—the brain tissue, the blood, and the cerebrospinal fluid. From a mechanical viewpoint these lesions are (1) space-occupying, such as tumors, abscesses, hemorrhages, etc., and (2) destructive, such as those following emboli, thrombi, trauma, etc. Since none of the intracranial contents are at all compressible, much of the extra room occupied by any foreign invader, such as a tumor, must be made up by a reduction in the amount of these intracranial constituents. Space in the cranio-vertebral chamber in the adult is obtained by both a local and more or less general anemia of the brain, by destruction of brain tissue, and, most important, by a reduction of the cerebrospinal spaces from which the fluid is forced.

Important as are the cerebral cavities in space-occupying lesions of the brain, they appear to be even more necessary in destructive lesions. Although in the former they yield but a part of the total space required, in the latter they appear to be called upon to make up for an overwhelming share of the loss of space. Depending on the size and position of the cerebral defect, either the cerebral ventricles or the subarachnoid spaces or both will dilate to equalize the defect. If the lesion is near the surface, the subarachnoid spaces will be the chief means of compensation. If the defect is large and more deeply situated, the ventricle will form a pouch to fill it. Very frequently both ventricles and the subarachnoid spaces will be dilated in response to the loss of brain tissue. The end results of emboli, thrombi, destructive effects of trauma, and the space remaining after the absorption of hemorrhage cause a loss of brain tissue which is replaced by dilatations of the fluid-containing spaces. The enlargement of the cerebral ventricles in these conditions, and especially the lateral ventricles, can be shown easily by the X ray.

Epilepsy should be regarded as a symptom. Convulsions which can not be distinguished from the so-called idiopathic form of the disease are found in a great variety of cerebral diseases. The so-called idiopathic form of epilepsy, by its very name, presupposes

that there is no fundamental pathological change in the brain. Doctor Dandy is of the opinion that in most instances it is possible either to demonstrate the presence of a cerebral lesion or some accompanying change which indicates that a lesion is present.

His discussion of the gross changes that may be detected before or during operation is as follows:

The changes that one finds are: (1) Dilatation of the ventricles, (2) abnormally shaped ventricles, (3) dilatation of the subarachnoid spaces, (4) softening of the brain (atrophy), (5) areas of increased density (fibrosis or gliosis), and (6) changes in the meninges.

"Ventricular changes are especially striking where the lesion is restricted to one hemisphere. Such lesions cause enlargement of part or all of one lateral ventricle. Very frequently in large unilateral cerebral atrophies the contralateral ventricle is also dilated. Any part of a lateral ventricle or an entire ventricle may enlarge to compensate for the loss of brain tissue. When the lesion is bilateral and diffuse the lateral ventricles are so nearly symmetrical that, unless the dilatation is extreme, it is impossible to say that the ventricles are not of a large but normal size. Lateral ventricles which we have no reason to assume to be abnormal may be three or four times the size of other ventricles, also presumably normal. Marked enlargement of part of a lateral ventricle is readily detected at operation. The cortex may have entirely disappeared in places, or it may be distinctly thinner and soft to the touch. All grades of asymmetrical ventricular dilatation are demonstrable by ventriculography and the location of the ventricle's enlargement is, of course, precisely located. An example of this kind was presented among the earliest ventriculograms published by the author, and since then many others have been demonstrated by this method, and many have been disclosed at operation. I have been particularly impressed with the high percentage of cases of asymmetrical enlargement of a lateral ventricle with localized cerebral atrophy from the series of brains in Doctor Shanahan's collection at Sonyea. A large proportion of these patients had had a monoplegia, hemiplegia, or diplegia.

"Several deformed ventricles, both symmetrical and asymmetrical, have been demonstrated by ventriculography, and also from the pathological material, at Craig Colony. Such distorted ventricles indicate congenitally malconstructed brains.

"It is mainly at operation that dilatation of the subarachnoid spaces is demonstrable. After death the fluid quickly disappears, and particularly after the brain has been hardened this indicator is to a large extent lost. When very marked it can still be made out, even after fixation, but there is never the striking appearance post mortem, which is present in the brain at operation. One of the great advantages of inspecting the brain at operation is the comparison of

its volume with that of the intracranial cavity. There is hardly anything more striking than the collections of fluid which cover the surface of the brain of the epileptic. They stand out almost as sharply as tumors on the surface of the brain. Instead of the normal convolutions separated by narrow sulci containing a small amount of clear fluid, one sees *accumulations of fluid completely covering areas of the brain* to such an extent that the underlying cortex and its vessels are entirely invisible. Whereas normally the pia-arachnoid is in close contact with the surface of the convolutions and dips down between them, in epileptics the subarachnoid spaces are dilated and fluid passes freely across the convolutions. Instead of lines of fluid, there are now pools which communicate freely with one another. This communication can be shown by injecting a dye into the subarachnoid space. From the point of injection the dye can easily be pressed along for a considerable distance. This shows that these collections of fluid are merely dilatations of the subarachnoid space and not cysts. The extent and distribution of the fluid is variable. It may be quite localized, as over a post-traumatic area, or may cover a large part of the exposed hemisphere, and (as shown by necropsy material) most of the outer surface of both hemispheres may be covered.

"Eliminating the focal lesions of known origin, such as healed infections, traumatic and vascular defects, etc., most of these brains show the maximum amount of fluid over the region of the motor cortex. There is less over the occipital and frontal lobes. The frontal lobe is usually implicated more than the occipital, the temporal scarcely at all. I have not found collections of fluid over the inferior surface of the temporal, frontal, and occipital lobes. The reason for this fairly uniform distribution is not clear. *These collections of fluid indicate, to my mind, that there has been a loss of brain tissue, in amount at least equal to the quantity of fluid.* The amount of fluid varies up to 100 cc., or even much more. After release of the fluid, by pricking and pressing it out, a cavity is seen between the brain and the dura, which varies in size with the extent of the cerebral lesion. There is no essential difference between the appearance of the brain surface from a case of Little's disease and from one due to any other kind of lesion, except in degree and the distribution of the fluid. Although quite variable, the fluid covering the brain of a patient afflicted with Little's disease is very extensive in depth and latitude.

"The meninges are definitely changed over the defective portion of the brain. Both color and texture differ from the normal. The color varies from a semitransparent pink to an opaque white. The contrast with the normal delicate transparent pia-arachnoid is striking. Part of the opacity is due to the depth of the bed of fluid, for.

after this has been released and the leptomeninges have settled upon the brain, the opacity may either be partially or entirely lost.

"The pia-arachnoid is thicker and tougher than normal. This can be demonstrated by inserting a dural hook into the arachnoid and gently pulling. The membrane is often so strong that the entire brain can be moved by the pull, in marked contrast to the normal delicate membrane which tears so readily. The opaque white arachnoid is thicker than the more transparent type. The thickening is not always uniform, but may occur in patches which are much whiter and more opaque. Histological examination shows that the thickening is due to an increase of connective tissue.

"After the cerebrospinal fluid over the affected area has been evacuated, the striking visual demonstration that the brain is abnormal is largely lost. At this stage the appearance is more nearly comparable to the brain at necropsy. But abnormalities in the brain are still evident, though closer inspection is required. There is a definite depression where the fluid has been released. The convolutions are narrower and sharper, the sulci deeper and wider.

"But palpation reveals a striking change of a different character in the brain. *The brain beneath the collection of fluid is softer than the contiguous normal brain.* When the gloved finger or brain spatula gently presses upon the normal brain, the indentation is slight because the resistance is that of a firm tissue, whereas, on palpation of this defective area, the finger or spatula sinks more deeply and the resistance imparted to the finger is less than in the normal brain. The transition between the normal and this diseased part of the brain may be gradual or quite sharp.

"In this connection it should be stated again that softening of the brain tissue is by no means specific for any particular kind of lesion. It merely indicates that a lesion of the brain exists. This softened area may be associated with a small tumor, a cyst, an area of atrophy, or it may be and frequently is found with the so-called idiopathic epilepsy. It is often very difficult to be certain of the nature of a lesion more than a centimeter below the cortex. But there are differences between the softened brain over the larger subcortical tumors and purely atrophic brain lesions. In the former the convolutions are wider and paler, the sulci are shallower, and the fluid over the surface is usually entirely squeezed out by the pressure.

"In addition to the dilated ventricles, the collections of fluid, the cerebral atrophy and the areas of softening in the brain, there is at times evidence of fibrosis, either in or below the center. This may be detected at operation by a visible scar if superficially situated, or by the impact of a ventricular needle if subcortical. When a ventricular needle is passed gently through the cerebral tissue, the scar causes an increased resistance to the needle's passage. It may be so dense

as to require considerable force before it can be penetrated. In five cases in which this has been demonstrated at operation there has been a previous history of trauma, with its etiological relationship to the epilepsy uncertain though probable. In one instance, a dense scar was encountered in the wall of the ventricle and extended along most of the body of the ventricle. In the other cases the scar was encountered at varying but lesser depths beneath the cortex, and in all but one of these the cortex appeared nearly normal. In one case the scar occupied an extensive area in the hemisphere and extended into the wall of the body and descending horn of the lateral ventricle, producing incomplete strictures of both the body and descending horn. A partial extirpation of nearly all of this mass was found to be possible without injury to the motor or sensory tracts. In all save one of these cases with fibrosis there was a marked atrophy of the brain with a bed of fluid over the cortex. It will depend upon the degree of cerebral atrophy or of fibrosis whether the brain is softer or firmer than normal to touch, and whether the passage of the ventricular needle is easier or more difficult.

"Another gross finding, which has been noted a few times in the localized lesions, is the presence of a few drops of fluid which drip from the ventricular needle when withdrawn from the lesion, whereas in the normal brain no fluid can be obtained. This finding indicates that there are small pockets of fluid within the substance of the lesion.

"The microscopic examination of material removed at operation is limited to three cases in which a localized lesion had been excised from silent areas and examined only with haemotoxylin and eosin staining. Two were from areas of softening without gross evidence of fibrosis, the third from a very dense fibrous growth. In all three the microscopic findings were essentially similar. The cortex seemed approximately normal, but beneath it there were collections of fibrous tissue, often in compact areas, and interspersed throughout the section were small cavities apparently containing fluid, but without an endothelial lining. The spaces doubtless account for the softening to touch as well as for the fluid obtained by puncture with the ventricular needle.

"I do not by any means assume that a similar histological picture will be found in the brains of all epileptics; certainly it will not. I desire to place no emphasis upon the histological picture at this time, other than to point out that the softening of the brain may properly be considered a trustworthy indication of a subcortical lesion.

"The increase of fluid over the brains of epileptics has long been recognized both at necropsy and operation. As early as 1885, the meningeal changes were well described by the great English neurologist and student of epilepsy, Sir William Gowers. But he con-

sidered the changes to be the product and in nowise the cause of the convulsions. The frequency of this finding is also recorded in the pathological reports of Prout and Pierce Clark (1904) and of Shanahan (1911-1921) from the extensive necropsy material at Craig Colony. Prout and Pierce Clark concurred in the view of Gowers that the fluid collections are merely the result of the attacks, and this, I believe, is the prevalent impression at the present time.

"Alexander (1911) was greatly impressed with these collections of fluid observed at operation and considered them to have a direct bearing on the cause of epilepsy. He particularly emphasized the greater prominence of these findings at operation than post-mortem, when they might well be overlooked. He attempted to reproduce these subarachnoid collections in animals, but failed to produce epilepsy. For the cure of epilepsy he suggested and carried out quite extensively an operation which he termed 'fenestrations of the dura.' But both his experimental and curative efforts failed, and with these failures his claims for the relationship of the fluid collections with epilepsy were discredited. He mistook the effect (the fluid) for the cause (the cerebral atrophy).

"But these changes in the meninges and the enlargement of the subarachnoid spaces can not be dismissed with the statement that they are a result of the convulsions, for many of the most severe cases of epilepsy (the congenital type) do not have an increase of fluid. If convulsions should in any conceivable manner produce such intracranial alterations, it would be difficult to explain why the fluid collections are in many instances so strictly localized and why the process is not universal.

"The occurrence of a layer of gliosis under the pia has been described by Féré, Bleuher, Alzheimer, and others.

"The findings described are by no means found in all cases of epilepsy, but they are, I believe, to be expected in one form or another in cases that are acquired after birth. Congenital defects of the brain may or may not be associated with plainly marked external signs. The soft plastic skull of intrauterine life may more readily be molded to the defective brain. But congenitally malconstructed brains are frequently well shaped and symmetrical; i. e., there may be no gross defects to fill with fluid or alter the shape of the skull, so that the meninges and the subarachnoid spaces will appear quite normal.

"In the course of operations for intracranial lesions other than epilepsy, areas of atrophied brain presumably similar to those described in epilepsy have been found in a few instances. These were nearly all chance findings, and are not related to the lesion for which the operation was performed. It could hardly be doubted that were a series of brains examined at operation in individuals ap-

parently normal a not inconsiderable percentage would show this lesion. The lesions surely can be present without epilepsy. The relationship of cerebral lesions to epilepsy may be compared to that of cerebral tumors to epilepsy. Only a certain proportion of brain tumors cause epilepsy. Of two tumors in different individuals, apparently similarly situated and of the same type, one will cause epilepsy and the other will not. There are reasons which we can not yet determine, but which are responsible for the seeming lack of uniformity in the causation of symptoms in many different diseases. There are also surely great differences in the susceptibility of individuals to convulsions, and doubtless there are differences in the intrinsic character of the lesions, although with our coarse methods of examination they may look alike."

CHEMICAL WARFARE.

The following data concerning chemical warfare and its relation to the Medical Department of the Army issued by the Medical Division of the Chemical Warfare Service appeared in the Army Medical Bulletin of August, 1923. It is republished here as a matter of interest to all naval medical officers and hospital corpsmen.

I. DEFINITION.

In the late war the term "gas" was used in connection with warfare to denote any of the several chemical agents used in combat, whether gases, liquids, or solids. Now the term employed for designating chemicals and chemical compounds used in war is "chemical agent."

The term "chemical agent" includes those chemicals and chemical compounds, whether gases, liquids, or solids, used in warfare for lethal, harassing, or neutralizing effect against personnel, and dependent primarily for effectiveness on direct chemical activity; those agents used for incendiary, corrosive, or spoliation effect against shelter, supplies, and matériel and for screening or obscuring operations in the field. Chemical agents differ materially from other projections against the enemy in that they are not dependent on momentum or disruptive force for effect (as, e. g., H. E., shrapnel, or rifle fire), but on direct chemical action. Their projection on a target is characterized by continuity of pattern; they are not momentary agents, all being characterized by some degree of persistency and the quality of diffusing into the surrounding air and enveloping everything within the area of efficient concentration.

II. CLASSIFICATION.

The several chemical agents fall into different classifications based upon their—

A. PHYSICAL STATE.

1. Gases.
2. Liquids.
3. Solids.

This classification is based upon physical condition at ordinary temperature likely to be encountered in the field.

Upon these qualities depend to a material extent the several methods of projection; e. g., gases, such as chlorine, which exert a relatively high vapor pressure can be liberated from cylinders forming gas clouds, which are carried along by the wind, while liquid agents, such as mustard, must be dispersed by an explosive charge sufficient to effect atomization and effective vaporization. Other liquids of different characteristics require different degrees of explosive force for effecting dispersion.

Solids, such as diphenylchlorarsine, can be effectively dispersed by an explosive charge completely pulverizing the agent. These same agents also can be effectively put over by volatilization, due to the heat-generating mixture of the so-called candle.

B. TACTICAL USES.

Class 1. Direct casualty agents.—Include those chemical agents which produce fatalities or sufficiently serious injuries to necessitate evacuation. Effectiveness is generally immediate, except in the case of vesicants.

Class 2. Harassing agents.—Include those chemical agents which produce a lowering of physical strength and morale either directly from irritating and debilitating effects or indirectly by necessitating continued wearing of mask or adoption of other means of protection.

Class 3. Neutralizing agents.—Include those chemical agents used for rendering terrain untenable.

Class 4. Screening agents.—Include various smokes used for screening and obscuring purposes.

Class 5. Incendiary and corrosive agents.—Include those chemical agents which produce direct damage to enemy shelter, material, and supplies, including rendition of food unfit for consumption.

MEDICAL ASPECTS OF CHEMICAL WARFARE WEAPONS.

Effects of war chemicals on the human body.—a. General: The symptoms produced by war chemicals depend to a certain extent upon

the chemicals and concentrations used, the length of exposure, physical condition of the person affected, and the manner in which he conducted himself after being exposed. The various chemicals used in warfare have an especial effect on some particular part of the body, and based upon this they are classified accordingly. It must be remembered, however, that several chemicals, each affecting different parts of the body, may be used at the same time, thereby producing a variety of symptoms. According to their principal action on the body, war chemicals are classified as follows:

ACTION.	GAS.
(1) Lung irritants-----	{ Chlorine.
	{ Phosgene.
(2) Sternutators-----	{ Chlorpicrin.
	{ Diphenylchlorarsine.
(3) Lachrymators-----	{ Brombenzylcyanide.
	{ Chloracetophenone.
(4) Vesicants-----	Yprite (mustard gas).
(5) Direct poisons of the nervous system----	Hydrocyanic-acid gas (vincennite).
(6) Gases interfering with the respiratory properties of the blood-----	Carbon monoxide.

b. Lung irritants: The main symptoms of poisoning by these lung irritants may be summed up as follows:

(1) Catching of the breath, choking, and coughing immediately upon exposure to-gas.

(2) Inability to expand the chest in full breath after removal from the poisoned air.

(3) Vomiting, hurried shallow respiration or breathing, sometimes coughing with an abundant expectoration; pain is felt behind the sternum or breastbone and lower part of the chest.

(4) The patient gets blue in the face, or in severe cases may go to the gray condition, which is very serious.

c. Lachrymators: These are tear-producing chemicals and in concentrations as low as .00015 milligrams per liter produce an irritant action on the eyes, causing a profuse flow of tears, accompanied with pain and impairment of vision.

d. Sternutators: These are sneezing gases producing a moderate irritation of the mucous membranes of the nose and throat.

e. Vesicants: This group of chemicals is distinguished from the irritants by the persistency of their action. Ground sprinkled with them may be dangerous for days or weeks following. Dichlorethyl-sulphide, or mustard gas, is the best vesicant known. The main features of mustard poison may be summed up as follows:

(1) Delay of the irritant effect for several hours, followed by a comparatively slow development of the various inflammatory reactions.

(2) Vomiting and a sense of burning in the eyes with discomfort in the throat, hoarse cough, and pain behind the breastbone.

(3) Intense inflammation of the eyes, which may cause temporary blindness, due to the swelling of the lids.

(4) Burning of the exposed skin surfaces and of most areas of the body, followed by blistering and staining.

(5) Inflammation of the mucous membrane of the respiratory tract with the secondary development of infective bronchitis or septic broncho-pneumonia.

f. Smokes: While most of these substances are more or less poisonous, the degree of their poison is far below that of the other chemical-warfare agents, and in the concentrations which are likely to be encountered in the field they are negligible.

g. Phosphorus: Two forms of phosphorus are used for military purposes; the white and red. Taken internally in small amounts, they act as violent poisons and when coming in contact with the skin produce severe burns.

The prevention and first-aid treatment of casualties produced by war chemicals:

Prevention.—Inasmuch as all war chemicals are heavier than air and therefore naturally settle in shell holes and depressions in the earth and in dugouts, trenches, etc., a most important measure in the prevention of casualties is, when practicable, to seek high ground and the open in gassed areas in order to escape from contaminated air.

The most effective way to prevent the deleterious effects of war chemicals on the eyes, face, and respiratory system is the prompt use of the gas mask. In the absence of a gas mask the prevention of the breathing of toxic atmosphere may be accomplished to a certain extent by the following emergency means: Breathe through a handkerchief saturated with urine or a liquid of some kind. If impossible to obtain a handkerchief, an old sock, piece of cotton, or a newspaper may be used for the same purpose. If impossible to obtain these materials, earth moistened in the above manner can be scooped up and placed over the face.

GENERAL TREATMENT OF CHEMICAL-WARFARE CASUALTIES.

In view of the multiplicity of the symptoms produced by warfare chemicals, together with their varying degrees of severity, it is almost impossible to define a prescribed line of treatment for casualties suffering from the effects of these materials. As a result, every case must be treated on its merits. In all cases, however, the following fundamental rules are applicable and should be strictly adhered to when possible:

1. Remove the patient or suspect to a pure atmosphere.

2. Consider all persons who have been exposed to warfare chemicals and who present any signs of contamination as casualties until proven otherwise.

The treatment of all chemical-warfare casualties should begin at the very front line and continue all along to the rear.

Irritants.—In considering the treatment of these cases the grave issue to be met is pulmonary œdema or the accumulation of fluid in the lungs, which condition interferes with oxygen want, the contamination of the blood, and the overloading of the right heart. The principles involved in the treatment of these cases may be summed up as follows:

1. Absolute rest for the purpose of saving oxygen in the body.
2. Body warmth for the same purpose.
3. The administration of oxygen to take the place of that which can not be inhaled naturally.
4. Venisection or bleeding the patient to combat the œdema and relieve the right heart.
5. Endeavor to rid the body of accumulated chemical products.
6. Adopt all means to prevent secondary infection; cleanliness.
7. Make the patient comfortable.
8. The administration of hot coffee as a stimulant to the heart.

Vesicants.—When it is known that vesicants or blistering chemicals are present, measures (in addition to use of the gas mask) to prevent their action should, when practicable, be taken as follows:

- (a) Remove all clothing and equipment.
- (b) Disinfect infected or exposed areas, in the case of the hands. The simplest treatment, if the hands are dry, is to rub them with dry chloride of lime. This method can not be employed on the more delicate parts of the skin. These parts should be washed and bathed with hot water and rinsed off with bicarbonate of soda solution. The application of coal oil or kerosene to the parts is very helpful. The treatments administered for ordinary burns may be used successfully in these cases. The eyes are disinfected by bathing with a solution of bicarbonate of soda 2 per cent. which should be repeated several times a day. The eyes should never be bandaged for the reason that it causes a retention of the secretions. The mucous membranes of the nasal passages should be sprayed with a strong solution of bicarbonate of soda.

(c) The use of protective gloves and clothing by all who come in contact with mustard-gas patients should be strictly observed. In the treatment of these cases, like those of the irritant group, judgment and common sense are required. Soldiers and others coming in contact with animals exposed to the fumes of mustard gas must always bear in mind that the hair on these animals retain the gas

and may be the means of producing severe gas casualties among those coming in contact with them. In all cases the utmost precautions must be observed, and those caring for these animals should always be gloved and when possible protected with gas-proof clothing. When possible the animals should be subjected to washes of lime water after departure from the contaminated atmosphere.

Sternutators and lachrymators.—For the ordinary cases no treatment is necessary. The removal to gas-free atmosphere will soon accomplish the desired results.

Phosphorus poisoning.—Phosphorus burns come under the same category as burns caused by acid and alkali and are of persistent character. With severe burns shock is always present. The treatment is difficult, inasmuch as healing does not take place until the sloughs entirely disappear, which may require weeks or months. Shock and pain must be relieved. Hot coffee and stimulant for the former, opium for the latter. The burned areas should be cleansed with some mild antiseptic before treatment is administered. The treatment has proven highly efficacious for burns of this character.

Treatment for carbon-monoxide poisoning.—Patients suffering from carbon-monoxide gas poisoning should be removed immediately to a clear atmosphere. They should be wrapped in blankets and kept at absolute rest, thereby retaining the oxygen in the body. Oxygen should be administered as soon as possible. If the breathing is shallow, artificial respiration, together with friction of the lower limbs, should be resorted to.

Treatment of hydrocyanic poisoning.—The action of hydrocyanic acid gas is so rapid but little can be accomplished in the line of treatment.

Degassing clothing and other materials.—The degassing of clothing and other materials which have been contaminated with war chemicals, particularly with mustard gas, must be accomplished with caution by those employed in the work. They must use gas masks, rubber gloves, and protective clothing when gas is present or is suspected. There are two general methods of removing poisonous gases from clothing and other materials, viz., chemical and physical:

(a) The chemical methods consist in soaking the articles, when practicable, in a solution of one of the following: Chloride of lime, chlorine, alkaline soap, or sodium bicarbonate.

(b) The physical methods consist in employing one or more of the following agencies: Moist heat, running water, steam under pressure, steam not under pressure, sunlight, and open air. The best method is sterilization with steam. Clothing and materials subjected to steam (either under pressure or not under pressure) for half an hour are rendered free from war chemicals.

III. MEDICAL ORGANIZATION FOR TREATING CASUALTIES SUFFERING FROM THE EFFECTS OF WARFARE CHEMICALS.

A medical organization capable of meeting the special requirements expected of it in handling casualties resulting from chemical warfare must be a strong coordinating body embracing all of the divisions of relief, including those in the combat zone, along the lines of communication and at the base. Every officer and enlisted man of the Medical Department connected with the various relief organizations of the Army should have a thorough knowledge of the latest treatment of chemical warfare casualties.

Relief stations.—All of the relief stations now contemplated by the scheme of organization will be augmented by the Medical Department with special equipment and when necessary additional personnel for the purpose of treating casualties by chemical warfare. These stations are as follows:

(A) Chemical warfare sections of battalion and regimental aid stations.

(B) Chemical warfare sections of collecting stations.

(C) Chemical warfare sections of hospital stations.

(D) Hospital stations established in emergencies by medical regiments of corps or armies for the exclusive treatment of chemical warfare casualties, particularly when in large numbers and when transportation further to the rear is contraindicated.

Chemical warfare section of regimental and battalion aid stations.—In order to curtail to a minimum the number of relief stations in the zone of activities and to avoid duplication of personnel and equipment, chemical warfare sections will when occasion demands be established in connection with battalion and regimental aid stations for the purpose of treating casualties suffering from the effects of exposure to warfare chemicals.

The number of these sections and their size depend upon the probable requirements. As a rule they should be established as near the front lines as conditions will permit and should be protected against the effects of warfare chemicals and provided with the essential equipment for administering first aid to those suffering from the effects of this method of warfare. At these stations patients, especially those suffering from lung irritants, should be kept at rest. As a rule they should lie down and be evacuated in a recumbent position. If vesicants have been used, the patients' clothing should be removed, their hands disinfected with chloride of lime, and their eyes bathed with a 2 per cent solution of sodium bicarbonate.

Treatment to be administered at aid stations—

1. Retain masks on patients till danger is over.

2. Patients should avoid unnecessary movements, especially if suffering from lung irritants.

3. Inhalations of ammonia by litter bearers to all cases with dyspnea.

4. Loosen or remove clothing; remove equipment.

5. Encourage vomiting by tepid salt water.

Collecting stations.—The chemical warfare sections of these stations are operated in connection with the regular collecting stations established by the Medical Department. As a rule, these stations are established from 1,500 to 2,000 yards back of the front line, but conditions of the terrain and other circumstances may necessitate their establishment farther to the rear. The collecting stations, like the aid stations, must be in the chemical warfare zone which requires extra equipment, etc., to render them proof against these agencies. It is inadvisable to establish them in underground cellars, dugouts, or valleys, for the reason that chemical warfare gases, which are heavier than air, render these places extremely dangerous due to the stronger concentrations of gases that collect in them, as a result they should be established above ground and in the open.

Chemical warfare sections of collecting stations are established by the collecting companies of the Medical Department, and if in zones liable to be bombarded with warfare chemicals their regular equipment should be augmented by additional equipment to render them gas proof, together with sufficient supplies for administering treatment to chemical casualties, which should be obtained from the Army medical supply depot. Extra personnel can be detailed with these sections, either from reserve medical units at the rear or by sending up gas medical teams, each consisting of one medical officer, two trained nurses, and three enlisted men, all thoroughly instructed in the best methods of handling gas casualties.

At these stations every effort should be made to sift out the slightly gassed or nongassed, thus permitting their early return to the front lines and increasing the fighting forces, and at the same time preventing able-bodied men being evacuated to the rear.

Collecting station sections for handling chemical warfare cases should be divided into the following departments: (a) Receiving, (b) forwarding, (c) bathing, (d) departments for slightly gassed, (e) departments for seriously gassed, (f) departments for observation.

These sections should remain in operation as long as chemical warfare casualties are occurring in the front lines.

Chemical warfare casualties at these collecting stations are evacuated via the ambulance stations to the hospital stations in the rear.

The following treatment should be administered chemical warfare casualties at collecting stations:

1. Keep patients warm and in the recumbent position. Remove their contaminated clothing.
2. Administer oxygen if possible.
3. Treat the eyes of mustard-gas cases.
4. Retain shock cases as long as possible.
5. Bleed cyanosed cases when necessary.

Sorting sections of hospital stations.—Sorting sections, or what were designated as "triages" during the war, are the most important of any of the relief stations. Important for the reason that it is at these sections that the patients are sorted for final disposition. Non-gassed or doubtful cases of chemical poisoning passing the aid stations and collecting stations for lack of definite diagnosis, should be carefully examined at these stations until they can be positively diagnosed, thus enabling rational disposition. As a rule, these sections are established at the entrance to hospital station groups, about 4 to 5 miles back of the firing line and out of the gas zone. Here baths are given and the bathing is also supplemented by the disinfection of clothing and in exceptional cases by the issuing of clean clothing. If occasion demands, an entire hospital station may be designated for the exclusive care and treatment of gas casualties, and should be divided into special departments to meet the exigencies of the case and equipment should include: (a) A shower bath apparatus, (b) an apparatus for the disinfection of clothing and equipment, (c) equipment for special therapeutic treatment, including oxygen cylinders and apparatus for administering oxygen. This is practically the first station where men exposed to the action of vesicant gases can receive thorough baths and change of clothing.

Degassing stations.—These are motorized mobile stations, organized and equipped for the purpose of administering hot baths, sterilization of clothing or issuing new clothing when occasion demands to large bodies of troops who have been operating over terrain contaminated with mustard or other vesicant chemicals. Such stations are established only as a preventive (prophylactic) measure. They are not medical units but function under medical supervision.

Hospitals.—One or more evacuation hospitals may be exclusively set aside for the reception and treatment of chemical warfare casualties when the hospital stations of division, corps, and army are proving insufficient to meet the need. Here more protracted and thorough treatment can be given. When evacuation hospitals are designated for this purpose they should procure from the Army Medical Supply Depot the special equipment needed for carrying on this class of work. Gas teams from the specialist group are also assigned as the occasion demands.

Ambulance companies in chemical warfare.—All ambulance companies operating in zones where chemical warfare is used should be

prepared to administer and transport chemical warfare casualties. To fulfill this function, in addition to their regular equipment, each ambulance should carry an extra supply of blankets and as many oxygen bottles as there are patients to be carried. These bottles should be of one-liter capacity. To the cap of each bottle there should be attached a small rubber catheter with stopcock. When in use the bottles are placed between the blankets, the end of the catheter is passed into the nasal-pharynx of the patient, and the gas turned on, thus administering to him a sufficient supply of oxygen at a time when most needed. At the end of each journey or trip, ambulances which have carried patients exposed to vesicant gases should be thoroughly disinfected.

RULES CONCERNING CHEMICAL WARFARE WHICH EVERY OFFICER AND ENLISTED MAN SHOULD KNOW.

1. Every medical officer is responsible that the men under his command are so carefully instructed in defense measures against gas that they will properly protect themselves and intelligently aid those who have become casualties from exposure to gas.

Familiarity through continuous training with the means supplied to combat gas attacks and with the procedure necessary for the successful relief of those affected by poisonous gas is required of all officers and men.

2. Proficiency must be acquired in the quick adjustment of respirators and masks, especially as concerns holding the breath both at inspiration and expiration. A deep breath may fill the lungs with air contaminated with gas, causing disastrous results.

3. Care must be taken that men sleeping in closed spaces are not gassed by long exposure to small quantities of gas unknowingly brought in on their clothing or equipment.

4. No man affected by an irritant gas, however slightly, will be allowed to walk to a dressing station or to exert himself physically in any way.

5. Food and water supplies must be carefully and completely covered to prevent contamination from gas. Food which has been exposed to gas must be destroyed.

6. It is forbidden to use water from shell holes for drinking, cooking, washing, or bathing.

7. Do not put the fingers in the eyes or mouth, scratch the skin or touch the genitals or anus, and thus risk contamination with mustard gas unless the hands have been disinfected.

8. Mustard gas is promptly diffused in the presence of heat. Therefore no man wearing or bearing contaminated clothing will enter any heated room or dugout.

9. The use of latrines in an infected zone should be immediately forbidden until they have been disinfected and washed with chloride of lime.

10. Those who handle gassed cases and their discarded clothing and equipment must be properly protected by gas masks, anti-gas clothing, and oilcloth mittens, and be provided with tongs and pincers.

FRENCH VENEREAL PROPHYLACTIC TUBE.

We learn from an article on venereal diseases under army administration contributed to the Journal of the Royal Army Medical Corps of September, 1923, by Maj. A. T. Frost, R. A. M. C., that the French Army have been experimenting with a one-tube packet which contains cyanide of mercury 0.75 per cent, calomel 25 per cent, and thymol 1.75 per cent in 50 per cent lanoline, and 23 per cent soft paraffin put up in keratin capsules. Soap is also supplied. The action of this cream is bactericidal against the *Spirochaeta pallidum*, the gonococcus, and the organism or organisms of soft chancre. The Navy is testing chinosol added to the calomel cream in a one-tube packet.

The prophylactic packet at present in use in the British Army contains a tube of Metchnikoff's calomel cream to which is added oxy-cyanide of mercury in a strength of 1 in 1,000, also a swab of cotton inclosing a piece of soft soap, all inclosed in an envelope, with directions for use printed on the front.

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For review.

Books received for review will be returned in the absence of directions to the contrary.

INFECTION AND RESISTANCE, AN EXPOSITION OF THE BIOLOGICAL PHENOMENA UNDERLYING THE OCCURRENCE OF INFECTION AND THE RECOVERY OF THE ANIMAL BODY FROM INFECTIOUS DISEASE, WITH A CONSIDERATION OF THE PRINCIPLES UNDERLYING SPECIFIC DIAGNOSIS AND THERAPEUTIC MEASURES, by *Hans Zinsser, M. D., professor of bacteriology and immunity, Medical School, Harvard University, formerly professor of bacteriology at the College of Physicians and Surgeons, Columbia University.* Third edition. The Macmillan Co., New York, 1923.

"Infectious disease, biologically considered, is the reaction which takes place between invading microorganisms and their products, on the one hand, and the cells and fluids of the animal's body, on the other. The disease is the product of two variable factors, each of them to a certain extent amenable to analysis, and it is self-evident that no true understanding of this branch of medicine is possible without a knowledge of the biological principles which laboratory study has revealed."

For the purpose of helping to render such knowledge easily accessible this book was written in 1914. The popularity of the first edition and a change in the conception of the subject of immunity and resistance resulted in a revision of the book four years later.

In the third edition, which has recently appeared, the author presents the subject in the light of our present knowledge. The arrangement of the material has been considerably altered and is presented in what the author considers a more logical sequence. He begins with a discussion of infection and the problem of virulence, our present knowledge of immunity, the mechanism of natural im-

munity and the phenomena following upon active immunization. Toxin and antitoxin, the bactericidal properties of blood serum, our knowledge of complement fixation and its practical applications, agglutination and precipitation are presented in turn. There are chapters on antibodies, phagocytosis, anaphylaxis, and immunization. To illustrate the advances which have taken place in our knowledge of immunity in the last decade it may be stated that when the first edition of this book was published our knowledge of anaphylaxis consisted largely of numerous exact, but uncoordinated observations. The author informs us in the preface of the present edition that the researches of the various workers in the subject since that time have revealed "relationships and a basis for an orderly classification of phenomena; and although many important points are still matters of controversy, it has been possible to treat the subject of hypersusceptibility in a more orderly manner than was formerly possible."

The final chapters on practical therapeutic immunization present this phase of the subject in an illuminating manner.

DIAGNOSTIC METHODS, CHEMICAL, BACTERIOLOGICAL, AND MICROSCOPICAL, by *Ralph W. Webster, M. D., Ph. D., assistant professor of medical jurisprudence at Rush Medical College, University of Chicago.* Seventh edition. P. Blackiston's Son & Co., Philadelphia, Pa., 1928.

In this work the author has brought together the generally accepted facts regarding the various phases of clinical medicine which may be better understood by the application of laboratory methods and has presented those diagnostic methods which are of most use to the general practitioner.

The sputum, oral, nasal, aural, and conjunctival secretions, gastric contents, feces, the parasites of the human body, urine, the secretions of the genital organs, the blood, transudates, and exudates and the secretion of the mammary glands are considered fully. The volume ends with a short consideration of clinical bacteriology sufficient to give the general practitioner a fair working knowledge of the subject.

Only two years have passed since the last edition of this book appeared yet, in this time, many new diagnostic methods have been devised and in the present edition we find that the author has incorporated some of the new methods for typing pneumococci in the sputum, Albert's stain for diphtheria bacilli, Rehfuss's fractional method for the examination of the stomach contents, the Meltzer-Lyon method for obtaining bile, the brine flotation-loop method of Kofoed and Barber for detecting ova in stools, and many other useful new laboratory procedures.

Medical officers in charge of clinical laboratories will find this work useful for reference.

HEART RECORDS, THEIR INTERPRETATION AND PREPARATION, by *S. Calvin Smith, M. S., M. D.* F. A. Davis Co., Philadelphia, 1923.

In this manual on cardiography the author has succeeded in briefly presenting this fascinating subject in an interesting and readable manner. The book is what the author claims it to be, an elementary guide for those who wish to obtain information concerning polyography and electrocardiography. It is an index of the author's conception of the relative value of the two methods of graphically recording the heart beat that the section of electrocardiography takes up five-sixths of the book, while that on polyography is limited to one-sixth.

The chapters on the physiological basis of electrocardiography and the interpretation of normal and abnormal records are presented in a clear fashion. The various normal and abnormal varieties of the electrocardiogram are illustrated by a large number of beautiful curves. A careful study of these will amply repay the beginner in electrocardiography.

The most valuable part of the book, however, and that which supplies a definite need, at least in this country, is that which deals with the electrocardiographic equipment and the technique of its manipulation. The electrocardiograph is a complicated apparatus, and anyone who has ever had the experience of having something go wrong with it and of attempting to search for the cause of the trouble will appreciate the author's paragraphs on "locating difficulties."

The section on polyography barely gives an outline of the subject, but here also are given some valuable points in the technique of obtaining records.

The book presents a very attractive appearance and is replete with excellent cuts of pulse tracings, electrocardiographic curves, and various parts of apparatus. It furnishes a very handy manual for one who has not time to go deeply into the subject of graphic heart records.

A CLINICAL GUIDE TO BEDSIDE EXAMINATION, by *H. Elias, M. D., dozent and assistant at the first medical clinic of the University of Vienna, Austria; N. Jagic, M. D., extraordinary professor and chief physician to the Softenspital, Vienna, Austria, and A. Luger, M. D., dozent and assistant at the second medical clinic of the University of Vienna, Austria.* Arranged and translated by *William A. Brams, M. D., adjunct in medicine, Michael Reese Hospital, Chicago, Ill. Formerly lieutenant commander, Medical Corps, United States Navy.* Rebman Co., New York, N. Y., 1923.

This is a small volume which the authors have prepared in order to furnish the physician and student with a practical guide for the physical examination of a patient at the bedside. As it is important that the examination of the patient be thorough and that findings

be recorded in a uniform and orderly manner, the book opens with the presentation of a scheme of a physical examination at the bedside which is used in the medical clinics of the University of Vienna. In the succeeding pages is found a detailed consideration of the various points which will be noted during a physical examination conducted as indicated in the schema, in accordance with the order of their occurrence and regional distribution and of the diagnostic value of the various findings.

THE DEVELOPMENT OF THE HUMAN BODY, A MANUAL OF HUMAN EMBRYOLOGY, by *J. Playfair McMurrich, A. M., Ph. D., LL. D., professor of anatomy at the University of Toronto.* Seventh edition. P. Blakiston's Son & Co., Philadelphia, Pa., 1923.

The proper understanding and correlation of the mass of facts which constitute what is known as descriptive anatomy has always been a difficult task for the student. Part of the difficulty has been due to a lack of appreciation of the causes which have determined the structure and relations of the parts of the body, for without some knowledge of why things are so, the facts of anatomy stand as so many isolated items, while with such knowledge they become bound together to a continuous whole.

The key to the significance of the structure and relations of organs is their development, and in this book the author has given a concise statement of the development of the human body and a foundation for the proper understanding of the facts of anatomy.

CHEMISTRY, INORGANIC AND ORGANIC, WITH EXPERIMENTS, by *Charles Loudon Bloxam.* Eleventh edition. Revised by *Arthur G. Bloxam, F. I. C., and S. Judd Lewis, D. Sc., F. I. C.* P. Blakiston's Son & Co., Philadelphia, Pa., 1923.

This book, which has long been the standard in Great Britain, represents an exhaustive consideration of the field of chemistry. It has been planned to furnish in compact form as much as is possible in a textbook what is known of the modern aspect of this subject.

COLLECTED PAPERS OF THE MAYO CLINIC, ROCHESTER, MINN., edited by *Mrs. M. H. Mellish.* Volume XIV (1922). W. B. Saunders Co., Philadelphia, Pa., 1923.

These papers by the workers in the Mayo clinic cover a wide range of subjects and reflect the surgical progress of the year in that institution.

PHYSIOTHERAPY TECHNIC, A MANUAL OF APPLIED PHYSICS, by *C. M. Sampson, M. D.* C. V. Mosby Co., St. Louis, Mo., 1923.

Physiotherapy has become a highly specialized section of medical practice, and one who desires to become proficient therein must not only be well grounded in all the branches requisite to success in

general medicine or surgery but he must possess an intimate knowledge of the actions of the various physical remedies upon living tissues both in the normal and abnormal states and the technic which is essential if one is to achieve success with this therapeutic measure.

After the war the physiotherapy service became "the great salvage service" in the various reconstruction hospitals, and in this book the author describes the technic of the various methods of physiotherapy which was found to be most valuable in these hospitals.

OUTLINES OF MEDICAL ZOÖLOGY, by *Robert W. Hegner, professor of protozoology, William W. Cort, associate professor of helminthology, and Francis M. Root, associate in medical entomology, Johns Hopkins University.* The Macmillan Co., New York, 1923.

This is an excellent brief textbook on medical zoology designed for the use of public health officials and physicians, especially those practicing in tropical or subtropical countries.

THE DIVISION OF PREVENTIVE MEDICINE.

Lieut. Commander J. R. PERLPS, Medical Corps, United States Navy, in charge.

Notes on Preventive Medicine for Medical Officers, United States Navy.

EVALUATION OF METHODS IN PUBLIC HEALTH EDUCATION.

In April, 1922, the United States Public Health Service sent a questionnaire to a number of psychologists, health officials, and sanitarians for the purpose of collecting opinions based on study and experience that might aid in a review of methods and the synthesis or crystallization of knowledge relating to this subject.

The task of informing and educating the public and workers in the public health field must always be an important, perhaps the most important, activity of every health organization. It is through this activity that the way is prepared for the introduction of new methods and procedures in practical public health work, and the means found for consolidating in public opinion an attitude of mind conducive to the acceptance of well-tried ideas from the research laboratory, health surveys, and experimental health administration.

Like other activities in the field of public health work those engaged primarily in so-called public health educational work have extended their efforts greatly in recent years and a considerable number of new methods have been employed and partially developed. Among these the idea of following the schemes employed for successful advertising in the business world has become popular.

Much that passes under the name of public health education obviously has little or no educational value, and it is often questionable how much good is accomplished by the dissemination of what is merely information. For the most part it remains to be determined how in specific instances knowledge can best be imparted by the means available actually to develop a sound public opinion. This means that in addition to presenting opinions, facts, and conclusions by the spoken word, health exhibit, printed material, illustrations, motion pictures, or what not, the method adapted must be capable and successful in practice of generally arousing sufficient interest to lead people to think for themselves about the subject in

question so that they will formulate and develop opinions of their own, actively, not passively. They will then, upon their own initiative, seek more information and correlate it with knowledge previously acquired. Any method that succeeds in accomplishing such a result is entitled to be called an educational method.

Doubtless many of the methods employed by health departments really do educate a variable percentage of the people more or less effectively along the desired lines. But it is clear that a vast deal remains to be accomplished. One would think that the thoroughly understood dangers of a polluted water supply, which are bound to cost any community that tolerates unsafe water so much in monetary loss, sickness, and deaths, could be readily presented in such a way that no person in the community would fail insistently to demand pure water and constant protection through sanitary control. That is not the case. Horrible examples of the results of indifference on the part of the public to facts and warnings may be drawn from experience in different parts of the United States in very recent years. It is timely for the United States Public Health Service to undertake the task of consolidation, meditation, and synthesis of ideas resulting from a review of experience.

The New York State Department of Health commented editorially on this subject in its monthly bulletin, *Health News*, June, 1923, under the caption, "Advertising and health education," as follows:

"It is perhaps too readily assumed that health workers have only to imitate the methods of commercial advertising in order to succeed in 'selling health' to the public. Our claim that within reasonable limits a community can buy as much public health as it wants, and the use of similar slogans foster, perhaps not wisely, the tendency to identify health propaganda with the all-pervading methods and jargon of modern salesmanship. Mr. D. Edgar Rice, one of a dozen psychologists whose opinions regarding the technique of public-health education were recently obtained and published by the United States Public Health Service, gives us a more discriminating point of view. He reminds us that in advertising the appeal is to the selfish interests of the purchaser, while in public-health work the individual is asked to sacrifice apparent personal advantages for the general good, or to forego immediate pleasure for a more remote advantage.

"Advertisers and health workers both seek to influence behavior. Whatever throws light on the springs of conduct and the technique of changing people's habits is necessarily of interest to both groups. Yet it is one thing to hypnotize a man of 45 into buying a suit of clothes guaranteed to make him look like a college youth, and quite

a different problem to get him to forego his inalienable natural right to sneeze and cough promiscuously in a Pullman car. Different interests are involved and different instincts must be reached. Social pressure, according to the psychologists, is a resource which health workers must utilize. We sometimes have to get people not to do things because 'it is not done.' It is a slower and more complex task to influence behavior in that way than to reach a man's pocket nerve with a well-illustrated appeal to his vanity.

"Nevertheless, we have much to learn from the technique of the best advertising. Doctor Watson thinks that nothing could be worse than the public health education work of the past. If it is as bad as that, any sincere critic should be able to improve our methods. That we are willing to learn is evidenced by many recent developments, such as the clinics on health literature held at recent meetings of the American Public Health Association and the National Conference of Social Work, by the calling in of experienced advertising men to pass on samples of posters and circulars, and not least by such conferences and questionnaires as the one above referred to. This wholesome self-examination is already showing results. It would not be difficult now to find examples of popular health instruction which should meet the views of the psychologists, of health teaching which prefers the positive to the negative appeal, which enlists the emotions rather than relying on reason alone, and which emphasizes the setting up of health habits more than the mere giving of health information."

The following summary of the answers of 21 psychologists and 10 sanitarians to the questions asked by the United States Public Health Service is also taken from Health News, New York State Department of Health, for June, 1923:

"The answers show clearly that * * * there is general agreement that in future public health programs a much more important part will be played by public health education than in the past. There is general assent to the proposition that the psychologist must take a very important part in this work. The answers, however, reveal a lack of understanding between sanitarians and psychologists which must be eliminated if public health education is to assume its proper place.

"A report of the answers of 21 psychologists and 10 sanitarians (a total of 31) follows:

"The first question was:

"Will public health education (explained by an accompanying statement to refer only to health education among the general non-school-attending public) in the future be of greater or less importance in public health programs than at the present time?"

"In answer to this question seven sanitarians and seventeen psychologists indicate that in their opinion public health education will play a part of greater importance in public health programs in the future. The others gave qualifying answers.

"The next question was formulated as follows:

"From the standpoint of the educator and the psychologist, is the work in public health education now being done by various health agencies satisfactory?"

"Five sanitarians and ten psychologists state that in their opinion the work done to date has not been satisfactory.

"Others gave qualified answers. Dr. Ennion Williams considers that some of the work done has been very satisfactory. Dr. William F. Snow says: 'Perhaps this should be answered in the negative, but with the understanding that full recognition be given to the remarkably good work which has been done in the light of the difficulties presented.'

"Among the psychologists John B. Watson states that 'nothing could be worse' than the public health work being done by various health agencies.

"The answers to the next question support the replies given above.

"The question was:

"Is the charge justified that 'hit or miss' methods have been used in the past?"

"Eight of the sanitarians and twelve of the psychologists agree that this is the case. Dr. Henry F. Vaughan says: 'Yes; much money has been wasted in the past in so-called public-health educational work.' Doctor Snow is the only sanitarian who dissents. He thinks such methods have not been used 'except as such a charge may be applied to special instances.' Dr. Donald B. Armstrong says: 'Yes; yet much has been accomplished.'

"Nine of the psychologists prefer not to express an opinion on this question, apparently because they are not sufficiently informed regarding the efforts thus far put forth. It may be noted at this point that the psychologists showed some hesitation in replying to questions 1 and 2, also, apparently, for similar reasons.

"Question 4, *Does public-health education need a basic science?* and question 5, *What should this basic science be?* are considered together.

"Of the 10 sanitarians, 8 state that they believe public-health education needs a basic science, and 7 of them indicate in one way or another that this basic science should be psychology. Among these are Dr. Ennion Williams, Dr. A. J. McLaughlin, Dr. Donald B. Armstrong, Dr. Henry F. Vaughan, and Dr. S. W. Welch. Doctor Vaughan says that the basic science should be 'practical

and applied psychology, which does not mean necessarily a book-worm or a doctor of philosophy, but a man of common sense.'

"Only one sanitarian (Mr. Courtenay Dinwiddie) refers to the need for medicine or biology as a basic science, and, curiously enough, he is not a medical man. He states that in his opinion the basic science for public-health education should be 'practical pedagogy, with general training in hygiene and special training in whatever subject, if any, is to receive especial emphasis.' Doubtless others among the sanitarians assumed that such basic knowledge was necessary without specifically stating it.

"Among the psychologists, 16 believe that some branch of psychology is the basic science needed in the development of public-health education. Eight of these indicate the need for an additional basic science, such as medicine or biology.

"For example, Joseph Peterson replies: 'Biology in the large sense of the term, and psychology if not included in biology'; L. M. Terman: 'Must be based on biology and psychology'; John B. Watson: 'Psychology and medicine (psychiatry?) and physiology'; Daniel Starch: 'Medical and psychological science.' Sociology is mentioned in conjunction with psychology in one instance, and social psychology is the basic science suggested by Dr. Knight Dunlap and one other.

"In answer to questions 6, 7, and 8, very few persons in either group give, as requested, specific fully stated laws or principles of educational psychology, advertising psychology, or any other science which may be useful in the development of public-health education, although several refer to such laws and principles. A considerable number, however, suggest ways in which psychology must be helpful in the development of public-health education on a more scientific basis. The most useful suggestions come from psychologists.

"Dr. R. S. Woodworth says that 'the importance of "recitation" in learning suggests the advisability of appending to a "pamphlet" a set of questions to be answered.' Also, the 'importance of "repetition" of a lesson at intervals suggests the advisability of a follow-up system—e. g., a series of pamphlets, the later ones reviewing and applying the lessons contained in the earlier ones.' Doctor Woodworth believes that publicity matter must be tested with regard to 'attention value' and 'memory value.' He also thinks that the relative value of different 'appeals' should be examined.

"Dr. Joseph Peterson suggests that 'habits are kept up only by the presence of objective incentives,' and that 'interest and enthusiasm come through activity.' He also mentions two generally accepted psychological principles—that positive suggestions are usually better than negative ones, and that appeals must be personal and must relate to the fundamental instincts.

"Dr. L. M. Terman reminds us that knowledge alone does not insure the formulation of health habits.

"Mr. D. Edgar Rice says: 'All the principles of "appeal" and "response" have a bearing, but in advertising the appeal is largely a "selfish" one—that is, the prospective purchaser must be persuaded that the purchase will be to his own personal advantage. In public health work the individual is asked to *sacrifice* apparent personal advantages for the general good or to forego immediate pleasure for a more remote advantage. The problem is, therefore, radically different from those of either education or advertising. Their principal contribution is in their *method* of studying the problem and of applying fundamental psychological principles.'

"Dr. Carl C. Brigham suggests 'the application of empirical or experimental methods to the work of creating publicity material.'

"Dr. Carl E. Seashore says: 'Stress the positive aspect, the duty, and joy of life; use the principle of socialized activity rather than instruction; appeal to feeling rather than to reason.'

"Three principles mentioned by those who have been quoted are reiterated by a number: (1) That positive appeals are more effective than negative ones, (2) that since information alone is insufficient, steps must be taken to bring about the formation of those habits which will make for health, and (3) that human beings are not guided nearly as much by reason as we have thought in the past, and that, therefore, we must appeal more to their emotions.

"Several of the psychologists and one of the sanitarians (Mr. Courtenay Dinwiddie) refer to the laws of conditional reflexes and habits as applicable to public health education, but they do not attempt to show in just what ways these laws may be applied in preparing educational materials and in developing methods for their use.

"Of the sanitarians, Dr. Donald B. Armstrong makes helpful suggestions. He says: 'Certainly one important thing is to remember that individuals are moved largely by emotions and not ideas; that we must know the instincts and desires that may be influenced and direct our appeals to them.' In referring to the possible contribution to be made by the 'psychology of advertising,' he continues: 'It may be important to avoid an imitation of ordinary commercial advertising methods. The best commercial advertising is placed in first-class magazines and aims at a middle class with education enough to enjoy the magazines and money enough to buy the things advertised therein. This does not reach the great mass, to whom even the Saturday Evening Post is high brow. Much of our educational effort goes over the heads of the mass, because it follows commercial standards.'

"Dr. S. W. Welch also makes helpful suggestions. In his words, 'Applied knowledge (regarding health and disease) is valued in the degree that it leads to social satisfactions, which include wealth, power, beauty, health, joy, and service.'

"Questions 9 and 10 asked for principles or laws which may be used in 'putting across' information regarding disease and health and in influencing behavior in such a way that conduct detrimental to public health will be avoided.

"Dr. R. S. Woodworth suggests that we should remember in this connection that 'a large share of adults are on a par in intelligence with children 10 or 13,' and 'nevertheless the adult does not like to be talked down to like a child.' He also proposes as useful a 'law of "projection"—the tendency to attribute objectionable behavior to others rather than to the self. It is easier to get people to object to others sneezing into the air than to get the individual to have much conscience about doing so. Thus social pressure may be created.'

"Dr. Joseph Peterson also believes in the effectiveness of social pressure. He cites the principle that 'individual purposive conduct is affected largely by approval or disapproval, or imagined approval or disapproval.' 'Get people to feel or imagine,' he says, 'the disapproval of society in connection with wrong conduct.' Doctor Peterson also suggests that we must remember that a large per cent of people have low intelligence.

"Dr. Aaron J. Rosanoff suggests that the gregarious instinct (loyalty to herd appeal) may be used effectively in influencing behavior.

"Dr. Henry T. Moore believes that 'the repetition of stimulus (such as catch phrases) and habitual attitude' has value for the same purpose.

"Mr. D. Edgar Rice says that principles or laws for use in 'putting across' information regarding disease and health 'can be determined only by investigation. *A priori* opinions by those who have not made a special study of the problems are of little value.'

"Doctor Watson, Doctor Seashore, and others believe that fear must be appealed to in our efforts to influence behavior.

"Of the sanitarians, Doctor Armstrong and Doctor Welch make definite suggestions. The former says that in attempting to influence behavior conducive to health 'it is important to appeal to certain fundamental interests and instinct, such as personal welfare, love of family, pride in community, individual desire for superiority, etc.'

"The next question was:

"What are the chief limitations of psychology in its application to public-health education?"

"Dr. R. S. Woodworth believes that besides scientific principles, common sense and imagination are needed to apply those principles to concrete problems.

"Dr. L. M. Terman says: 'We don't know enough about the psychology of normal development.'

"There are no limitations of psychology in its application to public-health education, 'except money to carry out the work and the right kind of men,' says Dr. John B. Watson.

"Dr. S. W. Welch says that psychology is a comparatively new science, still in the experimental stage. To continue in his own words: 'A popular demand for knowledge in the field of applied psychology has led to its exploitation by numerous half-baked pseudoscientists whose public utterances have tended to discredit it among thinking people.'"

"Questions 12 and 13 refer to the usefulness of Doctor Watson's study of venereal disease educational materials and to the desirability of similar studies. Many of those replying were not familiar with this study, and therefore could not answer these questions. Dr. Knight Dunlap states that the study was 'useful as a ground breaker, to develop methods and show the lack of precise information available.'

"Dr. Adelbert Ford says that the study was 'very useful.' 'We need more of it,' he continues, 'but more carefully worked out.'

"Dr. Henry T. Moore believes that we need 'a study of the effectiveness of religious sanctions in relation to personal hygiene': also 'studies of the relation of athletic interest to personal hygiene.'

"Dr. L. M. Terman says in regard to Doctor Watson's study: 'I think it gave an interesting cross-section view of opinion * * *. We do not need similar studies. We need facts, not opinions. Must have carefully controlled researches if we are to get anywhere.' (Doctor Terman may refer to Watson and Lashley's 'Consensus of medical opinion upon questions related to sex education and venereal disease campaigns,' published in *Mental Hygiene*, October, 1920, instead of to the study of venereal disease educational material.)

"Dr. Z. C. Dickinson suggests that we should select communities where reliable health statistics are kept, conduct campaigns in public-health education in one community and not in the other, and compare results with the aid of statistics.

"In conclusion, the question was asked:

"What kind of scientists should be recruited to develop in a more systematic manner the work of public-health education?"

"The question suggested three kinds: 'Psychologists,' 'advertising psychologist,' 'educational psychologist,' and a line was left for naming 'any other kind of scientist.'

"In the replies of the 10 sanitarians, the educational psychologist is mentioned six times, the general psychologist three times, and the

advertising psychologist twice. Dr. S. W. Welch believes that we need the educational psychologist for this work. 'But the advisory service of these scientists,' he says, 'should be recruited from among the recognized leaders of education within the State and Nation rather than by setting up a competitive leadership in educational psychology within the State board of health.'

"It is significant that each of the sanitarians believes that some kind of a psychologist is needed to develop in a more systematic manner the work of public-health education. Only one in the group (Mr. Courtenay Dinwiddie) cites the need for any other kind of a scientist. As previously stated, he suggests the importance of the biologist and the sociologist.

"In examining the replies of the 21 psychologists to this question we find the general psychologist recommended thirteen times, the advertising psychologist eight times, the educational psychologist eleven times, the psychiatrist twice, a sanitarian of some kind seven times, the sociologist once. Mr. D. Edgar Rice seems to think that other kinds of scientists are not now so necessary as is the psychologist. 'The scientific facts are sufficiently determined,' he says. 'The problem is one of "putting across" propaganda.'

"In the preliminary statement regarding the questionnaire, attention was invited to the present confusion in the minds of sanitarians and educators regarding the meaning of the term 'public health education.' It was suggested that the term has been used at various times to refer to at least five different types of work which were described. Dr. C. E. Turner proposes that these five types of work be differentiated by the use of the following terms:

"(1) '*Health training*' or '*health instruction*' to refer to teaching children in school health habits and giving them health information.

"(2) '*Public health training*' to refer to teaching men and women to become health officers and nurses.

"(3) '*Health education*' to refer to teaching present and prospective school-teachers how to teach health habits and how to give health information.

"(4) '*Publicity work*' to refer to 'selling public health to the people' so that they will give moral and financial support to public health agencies and public health work.

"(5) '*Popular health education*' to refer to the giving to the general nonschool-attending public information regarding disease and hygiene, and influencing their behavior so that they will avoid disease and not expose other persons to infections."

HEALTH OF THE NAVY.

Although the time is approaching when the annual increase in sickness from infectious diseases of the respiratory type must be expected, the vital statistics of the Navy for the month of October indicate a continuance of very satisfactory health conditions. The figures show merely a 5 per cent increase in admission rates from respiratory diseases, including acute tonsillitis and acute bronchitis, for the past month as compared with September.

Indeed, there was a decrease in admissions for influenza during October, the admission rate for the entire Navy falling from 14.2 to 11.7 per 1,000 per annum. This rate is only about half the experienced median October rate for recent years. The weekly health index compiled by the United States Bureau of the Census from telegraphic returns from 71 representative cities for the week ended November 3 shows that the combined weekly death rate curve is following the curves for 1922 and 1921 very closely. There are no indications at present that influenza will become widely epidemic. However, a greater prevalence must be expected than in years immediately preceding the recent pandemic. The decrease in admissions for influenza in October was due to a 50 per cent decrease among the forces ashore. The admission rate for personnel afloat was practically the same as for the previous month. From the entire Navy reports of 114 cases were received. Twenty cases were reported by the battle fleet and 31 by the scouting fleet.

Pneumonia as well as influenza caused fewer admissions during October, only 21 cases being reported for the whole Navy as compared with 28 during September. The admission rate for the month was about 30 per cent less than the median rate for the corresponding month during the past five years.

Mumps was somewhat less prevalent in October than during the previous month. The admission rate for the United States fleet was about nine times as great as the rate for all forces ashore. With regard to actual cases, 152 were reported from the fleets, 132 from the battle fleet, and 6 from the scouting fleet, while but 10 cases were reported from all shore stations. No case was reported by any shore station in the United States. It would therefore appear that the cases now occurring on board ship are not dependent upon infection introduced by the transfer of men from naval training stations. It remains for ships that are now dealing with mumps cases to trace their sources of infection. During September and October the U. S. S. *Texas* has reported 138 cases, the U. S. S. *Oklahoma* 39, and the U. S. S. *Maryland* 27 cases.

German measles, which was quite prevalent two months ago, has ceased to figure in morbidity reports, only 7 cases having been reported by the entire Navy during October.

Ten cases of scarlet fever were reported from the naval training station, Great Lakes, Ill., during October. It has not yet been reported whether all these cases occurred among incoming recruits. Since then the diagnosis has been changed in four cases to tonsillitis or other title. With this exception scarlet fever is not prevalent at this time.

Dengue continues prevalent among marines in Haiti and Santo Domingo, 80 cases having been reported as occurring among approximately 4,000 marines. One hundred and four cases developed among these forces in September and 79 in August. Twenty cases were reported from other naval units in October, five from the Asiatic Fleet. Dengue continues to be more prevalent than in recent years.

The Navy has been comparatively free from malaria this autumn. It is gratifying to note that a steady decrease in the incidence has taken place during the worst part of the malaria season, the cases notified for the entire service decreasing from 159 in August to 93 in September and 74 in October. Approximately half of the cases occurred among marines in Haiti and Santo Domingo.

Diseases of the digestive system caused fewer admissions in October than in September. The total admission rate for disease, 412.9 per 1,000 per annum was low for the month of October, the median rate for the last three years being 576. Noninfectious diseases, as well as infections, caused fewer admissions to the sick list.

The rate for venereal diseases was also low for the month of October—99.25 as compared with the unusually high rate of 147.88 per 1,000 per annum in September. This rate (for the whole Navy) fluctuates a great deal as a result of the lack of regularity with which morbidity reports are received. The rate for forces afloat which is compiled from monthly reports of venereal disease (Form A), was 138.56 for all ships, month of September, as compared with 150.35 in August. The rate for shore stations in the United States dropped from 69 in September to 55.5 in October.

The rate for accidental injuries continues higher than three-year median rates for corresponding months. The admission rate, entire Navy, for all injuries and poisonings was 73.6 per 1,000 per annum in October as compared with 76.8 in September. The three-year October median rate is 66.2. Injuries which resulted from the grounding of destroyers at Pedernales Point, Calif., contributed to keep the rate high, because many of the Form F cards were not received until October.

The following table contains the rates per 1,000 per annum for the principal communicable diseases, October, 1923. For com-

parison corresponding median rates are given for the same month, years 1918 to 1922, inclusive:

	October, 1918-1922.	October, 1923.
Cerebrospinal fever.....	0	0
Diphtheria.....	.31	.21
German measles.....	.51	.72
Influenza.....	23.95	11.70
Malaria.....	28.02	7.59
Measles.....	3.90	1.74
Mumps.....	6.43	16.62
Pneumonia.....	3.05	2.16
Scarlet fever.....	.49	.82
Smallpox.....	0	0
Tuberculosis.....	4.11	1.74
Typhoid fever.....	.09	0

TYPHOID FEVER REPORTS.

The following cases of typhoid and paratyphoid fever have recently been reported to the bureau.

Case I.—Private, U. S. M. C. Admitted to sick list, naval hospital, Guam, June 13, 1923. Typhoid bacilli recovered from the blood. Agglutination tests positive in the higher dilutions. The disease ran a very mild course. Convalescent September 4, 1923; stool positive for typhoid bacilli.

He received typhoid prophylaxis January 11, 18, and 25, 1921.

Case II.—Reported from U. S. S. *Asheville* as occurring at Swatow, in June, 1923. Both typhoid and paratyphoid infections were prevalent ashore. Diagnosis was not confirmed by laboratory tests. Clinically a mild case of typhoid fever with the appearance of rose spots on the seventh day after admission.

This man received three injections of triple typhoid vaccine, the last injection April 16, 1923.

Case III.—Paratyphoid "B" infection. Private, U. S. M. C. Admitted to the sick list, naval hospital, Guam, upon arrival at Guam, June 19, 1923, with diagnosis "bacillary dysentery." He had been ashore on liberty in Honolulu, June 5, 1923, having left the marine barracks, Mare Island, Calif., May 29, 1923. June 6, at sea, he developed fever, abdominal distress, and diarrhea. The symptoms gradually increased in severity and upon admission to hospital in Guam 13 days later he was emaciated and had a septic temperature. Blood culture negative. No agglutination of typhoid bacilli. The disease ran a mild course. July 20, 1923, paratyphoid "B" bacilli isolated from his stool.

He received typhoid prophylaxis, three injections, November 7, 14, and 21, 1922.

Case IV.—Paratyphoid "B" infection. Private, U. S. M. C. Admitted to the sick list, United States marine detachment, American Legation, Peking, China, August 22, 1923. Diagnosis confirmed by agglutination of paratyphoid "B" bacilli (dilution not stated). Low titer agglutination (1 to 40) of paratyphoid "A" bacilli also obtained.

Health record (signature illegible) indicated that he received injections of typhoid vaccine October 17, 26, and November 2, 1922.

Case V.—Paratyphoid "A" infection. Private, U. S. M. C. Admitted to the sick list, United States marine detachment, American Legation, Peking, China, June 18, 1923. Diagnosis confirmed by isolating paratyphoid bacillus "A" from the urine. He recovered and was discharged to duty on July 9, 1923.

Health record (signature illegible) indicated that he received prophylaxis December 20, 27, 1921, and January 3, 1922.

VITAL STATISTICS.

The Monthly Health Index, which is published on the 15th of each month, contains the statistical data for individual ships and shore stations. The statistics appearing in this *BULLETIN* are summaries compiled from those published in the Monthly Health Index.

Annual rates, shown in the succeeding statistical table, are obtained as follows:

The total number of admissions to the sick list or the number of deaths reported during the period indicated is multiplied by $\frac{3.65}{2.8}$ or $\frac{3.65}{5}$ or 12, depending upon whether the period includes four or five weeks or a calendar month. The product is then multiplied by 1,000 and divided by the average complement.

E. R. STITT.

TABLE No. 1.—*Monthly report of morbidity in United States Navy and Marine Corps for the month of October, 1923.*

	Forces afloat.	Forces ashore.	Entire Navy.	Marine Corps.
Average strength.....	74,816	42,151	116,967	20,701
All causes:				
Number of admissions.....	2,653	2,618	5,271	909
Annual rate per 1,000.....	425.51	745.32	540.75	570.83
Disease only:				
Number of admissions.....	2,239	2,219	4,458	748
Annual rate per 1,000.....	359.11	631.73	457.35	467.72
Communicable diseases, exclusive of venereal disease:				
Number of admissions.....	315	217	532	136
Annual rate per 1,000.....	50.51	61.78	54.57	85.41
Venereal disease:				
Number of admissions.....	754	332	1,086	137
Annual rate per 1,000.....	120.93	94.52	111.41	86.03
Injuries and poisons:				
Number of admissions.....	414	399	813	161
Annual rate per 1,000.....	66.40	113.59	83.41	101.11

TABLE No. 2.—Number of admissions reported by Form F cards for certain diseases for the month of October, 1923.

	Forces afloat, Navy and ma- rines (strength, 74,816).		Forces ashore, Navy and ma- rines (strength, 42,151).		Total, Navy and marines (strength 116,967).	
	Number of ad- missions.	Annual rate per 1,000.	Number of ad- missions.	Annual rate per 1,000.	Number of ad- missions.	Annual rate per 1,000.
Diseases.....	2,239	359.11	2,219	631.73	4,458	457.85
Injuries and poisons.....	414	66.40	399	113.59	813	83.41
Total admissions.....	2,653	425.51	2,618	745.32	5,271	540.75
Class III:						
Appendicitis, acute.....	29	4.65	36	10.25	65	6.67
Autointoxication, intestinal.....	8	1.28	10	2.85	18	1.86
Cholangitis, acute.....	15	2.41	13	3.70	28	2.87
Cholecystitis, acute.....	0	0	2	.57	2	.21
Cholelithiasis.....	1	.16	0	0	1	.10
Colitis, acute.....	0	0	3	.85	3	.31
Constipation.....	13	2.09	29	8.26	42	4.31
Enteritis, acute.....	14	2.25	28	7.97	42	4.31
Gastritis, acute catarrhal.....	6	.96	13	3.70	19	1.95
Gastroenteritis.....	55	8.82	51	14.52	106	10.87
Hemorrhoids.....	13	2.09	12	3.42	25	2.56
Pharyngitis, acute.....	9	1.44	14	3.99	23	2.36
Ulcer of duodenum.....	2	.32	0	0	2	.21
Ulcer of mouth.....	1	.16	0	0	1	.10
Ulcer of stomach.....	1	.16	0	0	1	.10
Total.....	167	26.79	211	60.07	378	38.78
Class VII:						
Varicocele.....	8	1.28	15	4.27	23	2.36
Class VIII:						
Diphtheria.....	2	.32	0	0	2	.21
German measles.....	6	.96	1	.28	7	.72
Influenza.....	86	13.79	28	7.97	114	11.70
Measles.....	14	2.25	3	.85	17	1.74
Mumps.....	152	24.38	10	2.85	162	16.62
Pneumonia, broncho.....	1	.16	6	1.71	7	.72
Pneumonia, lobar.....	3	.48	11	3.13	14	1.44
Scarlet fever.....	3	.48	5	1.42	8	.82
Whooping cough.....	0	0	1	.28	1	.10
Total.....	267	42.82	65	18.50	332	34.06
Class IX:						
Dysentery, bacillary.....	1	.16	3	.85	4	.41
Dysentery, entamebic.....	1	.16	3	.85	4	.41
Total.....	2	.32	6	1.71	8	.82
Class X:						
Dengue.....	20	3.21	80	22.78	100	10.26
Filariasis.....	0	0	1	.28	1	.10
Malaria.....	17	2.73	57	16.23	74	7.59
Total.....	37	5.93	138	39.29	175	17.95
Class XI:						
Tuberculosis (all forms).....	9	1.44	8	2.28	17	1.74
Class XII:						
Chancroid.....	219	35.16	59	16.80	278	28.32
Gonococcus infection.....	466	74.74	223	63.49	689	70.68
Syphilis.....	69	11.07	50	14.23	119	12.21
Total.....	754	120.93	332	94.52	1,086	111.41
Class XVIII:						
Bronchitis, acute.....	108	17.32	189	53.81	297	30.47
Laryngitis, acute.....	2	.32	2	.57	4	.41
Pleurisy, acute fibrinous.....	5	.80	9	2.56	14	1.44
Rhinitis, acute.....	6	.96	17	4.84	23	2.36
Tonsillitis, acute follicular.....	199	31.92	125	35.59	324	33.24
Total.....	320	51.32	342	97.36	662	67.91
Class XX:						
Hernia.....	20	3.21	26	7.40	46	4.72

TABLE No. 3.—Summary of annual admission rates for venereal disease reported from ships for September and from various shore stations for the four-week period October 7 to November 3, 1923.

	Annual rate per 1,000, September.			Average rate since July 1, 1923.		
	Minimum rate.	Mean rate.	Maximum rate.	Minimum rate.	Mean rate.	Maximum rate.
All ships.....	0	138.56	1,157.36	0	151.27	1,287.80
Battleship divisions—						
Battle fleet.....	50.93	107.07	249.38	74.70	114.49	140.64
Scouting fleet.....	56.34	120.69	259.98	104.52	164.46	261.31
Asiatic fleet.....	0	386.38	1,157.36	0	534.80	1,125.00
Destroyer squadrons—						
Battle fleet.....	0	58.23	558.14	0	82.59	354.24
Scouting fleet.....	0	143.06	593.26	0	178.91	533.33
Asiatic fleet.....	166.34	286.36	638.30	0	279.65	1,287.80
Miscellaneous— ¹						
Battle fleet.....	0	124.54	654.55	0	118.34	424.78
Scouting fleet.....	0	112.41	1,066.67	0	129.22	600.00
Asiatic fleet.....	0	366.70	952.38	44.94	350.44	1,008.40
Naval forces, Europe.....	0	177.94	381.35	0	208.26	441.47
Special service squadron, bases on Panama.	100.28	189.72	262.77	67.23	192.34	289.45
Naval transportation service.....	0	163.84	403.36	20.69	161.86	336.73
Special duty.....	0	109.17	279.07	0	83.87	585.37
Miscellaneous and district vessels.....	0	296.77	471.61	0	218.03	578.10
Annual rate per 1,000, Oct. 7 to Nov. 3, 1923.						
All naval districts in the United States....	0	55.47	323.65	0	68.49	247.23
First naval district.....	0	65.79	323.65	29.62	57.35	180.05
Third naval district.....	24.95	69.03	107.00	11.54	78.43	130.00
Fourth naval district.....	20.90	56.03	84.42	22.84	109.60	55.44
Fifth naval district.....	0	42.50	75.04	0	66.63	108.76
Sixth naval district.....	35.97	43.24	147.73	46.22	60.38	247.23
Seventh naval district.....	0	0	0	0	0	0
Eighth naval district.....	16.07	53.89	250.00	42.67	46.82	66.12
Ninth naval district.....	116.27	116.27	116.27	104.68	104.68	104.68
Eleventh naval district.....	0	19.31	28.21	15.95	32.93	80.88
Twelfth naval district.....	73.52	170.27	317.99	32.62	85.26	165.29
Thirteenth naval district.....	0	71.56	91.33	36.25	93.64	181.44

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE.

	Per cent, September.		Per cent since July 1, 1923.	
	Gonococcus.	Syphilis.	Gonococcus.	Syphilis.
All ships.....	67.08	9.72	69.37	8.31
Battleship division—				
Battle fleet.....	87.14	7.14	88.05	7.74
Scouting fleet.....	65.15	12.12	70.07	6.34
Asiatic fleet.....	36.54	23.08	39.90	16.26
Destroyer squadrons—				
Battle fleet.....	89.28	10.72	91.89	4.50
Scouting fleet.....	55.10	6.12	60.33	6.52
Asiatic fleet.....	61.90	9.52	50.75	13.43
Miscellaneous— ¹				
Battle fleet.....	88.23	5.88	89.19	4.50
Scouting fleet.....	69.39	16.33	66.88	14.37
Asiatic fleet.....	62.07	0	50.00	12.12
Naval forces, Europe.....	66.67	4.17	65.48	5.95
Special service squadron bases on Panama.	50.00	5.00	56.72	1.49
Naval transportation service.....	54.00	2.00	66.45	5.16
Special duty.....	61.54	23.08	66.00	10.00
Miscellaneous and district vessels.....	51.28	17.95	61.04	9.09

¹ Vessels of train, base, air squadrons, etc.

TABLE No. 3.—*Summary of annual admission rates for venereal disease reported from ships for September and from various shore stations, etc.—Continued.*

RATIO OF GONOCOCCUS AND SYPHILIS INFECTIONS TO TOTAL CASES OF VENEREAL DISEASE—Continued.

	Per cent, Oct. 7 to Nov. 3, 1923.		Per cent since July 1, 1923.	
	Gono- coccus.	Syphilis.	Gono- coccus.	Syphilis.
All naval districts in the United States.....	85.81	4.48	78.54	9.59
First naval district.....	91.67	8.33	81.61	16.09
Third naval district.....	75.00	8.33	70.69	13.79
Fourth naval district.....	83.33	0	78.43	9.80
Fifth naval district.....	83.33	8.33	73.81	10.45
Sixth naval district.....	77.78	11.11	71.11	6.67
Seventh naval district.....	0	0	0	0
Eighth naval district.....	75.00	0	81.25	0
Ninth naval district.....	100.00	0	83.33	8.00
Eleventh naval district.....	100.00	0	82.35	8.82
Twelfth naval district.....	72.00	0	86.54	1.92
Thirteenth naval district.....	100.00	0	96.88	3.12

TABLE No. 4.—*Number of admissions reported by Form F cards and annual rates per 1,000, entire Navy, for the four-week period October 7 to November 3, 1923, inclusive.*

Classes.	Navy (comple- ment, 96,266).		Marine Corps (com- plement, 20,701).		Total (comple- ment, 116,967).	
	Number of admis- sions.	Annual rate per 1,000.	Number of admis- sions.	Annual rate per 1,000.	Number of admis- sions.	Annual rate per 1,000.
Diseases of blood.....	1	0.14	0	0	1	0.11
Diseases of circulatory system.....	23	3.11	4	2.51	27	3.00
Diseases of digestive system.....	370	49.96	114	71.59	484	53.79
Diseases of ductless glands and spleen.....	2	.27	1	.63	3	.33
Diseases of ear.....	45	6.08	23	14.44	68	7.56
Diseases of eye and adnexa.....	49	6.62	9	5.65	58	6.45
Diseases of genito-urinary system (non- venereal).....	102	13.77	15	9.42	117	13.00
Communicable diseases transmissible by oral and nasal discharges.....	248	33.49	36	22.61	284	31.56
Communicable diseases transmissible by intestinal discharges.....	2	.27	3	1.88	5	.56
Communicable diseases transmissible by insects and other arthropods.....	70	9.45	95	59.66	165	18.34
Tuberculosis (all forms).....	13	1.76	2	1.26	15	1.67
Venereal diseases.....	756	102.09	137	86.03	893	99.25
Other diseases of infective type.....	174	23.50	67	42.07	241	26.78
Diseases of lymphatic system.....	36	4.86	12	7.54	48	5.33
Diseases of mind.....	18	2.43	10	6.28	28	3.11
Diseases of motor system.....	35	4.73	24	15.07	59	6.56
Diseases of nervous system.....	36	4.86	12	7.54	48	5.33
Diseases of respiratory system.....	546	79.13	122	76.61	708	78.69
Diseases of skin, hair, and nails.....	51	6.89	19	11.93	70	7.78
Hernia.....	37	5.00	7	4.40	44	4.89
Miscellaneous diseases and conditions.....	211	28.49	27	16.96	238	26.45
Parasites (fungi and certain animal para- sites).....	95	12.83	8	5.02	103	11.45
Tumors.....	7	.95	1	.63	8	.89
Injuries.....	470	63.47	124	77.87	594	66.02
Poisons.....	31	4.19	37	23.24	68	7.56
Total.....	3,468	468.32	909	570.83	4,377	485.46

TABLE No. 5.—Deaths reported, entire Navy, for the four-week period October 7 to November 3, 1923, inclusive.

Cause.	Navy (strength, 96,266)	Marine Corps (strength, 20,701).	Total (strength, 116,967).
Pneumonia, broncho.....	1	0	1
Tuberculosis, chronic pulmonary.....	1	0	1
Syphilis.....	1	0	1
Malignant growths.....	0	1	1
Other diseases.....	4	2	6
Drowning ¹	23	1	24
Injuries ²	12	1	13
Poisons.....	2	2	4
Total.....	44	7	51
Annual death rate per 1,000, all causes.....	5.94	4.40	5.67
Annual death rate per 1,000, diseases only.....	.95	1.88	1.11

¹ There were 23 drownings reported from the destroyers grounded at Pedernales Point, Calif., Sept. 8, 1923.

² Included in the table are 4 deaths from injuries caused by the collapse of the U. S. naval hospital, Yokohama, Japan, as a result of an earthquake Sept. 1, 1923.

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